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Financial Literacy at WPI: An Investigation into the Current State and Recommendations for Educational Improvement

Christopher James Rodgers
Worcester Polytechnic Institute

Mary T. Hatfalvi
Worcester Polytechnic Institute

Shivam Hitesh Mehta
Worcester Polytechnic Institute

Suilio Jose Simo
Worcester Polytechnic Institute

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Financial Literacy at WPI:

*An Investigation into the Current State
and Recommendations for Educational Improvement*



By:

Mary Hatfalvi

Shivam Mehta

Christopher Rodgers

Sulio Simo

Financial Literacy at WPI:

*An Investigation into the Current State
and Recommendations for Educational Improvements*

An Interactive Qualifying Project Report

Submitted to the Faculty of



WORCESTER POLYTECHNIC INSTITUTE

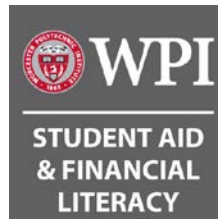
in partial fulfillment of the requirements for the Degree of Bachelor of Science

by:

Mary Hatfalvi
Shivam Mehta
Christopher Rodgers
Sulio Simo

Sponsored by:

Monica Blondin, Executive Director of Student Aid & Financial Literacy



Date: December 15, 2016

Report Submitted to:

Fabienne Miller

Abstract

Financial literacy is important because it leads to better financial decision making, but has been severely lacking in college students due to poor or nonexistent high school education. Our goals were to find the current state of WPI student financial literacy and to determine whether past education has been effective, as well as finding the optimal educational method for WPI students. These goals were accomplished by surveying and interviewing WPI undergraduates, graduates, alumni, and professionals in the field of finance. We then synthesized all of our collected data and drew conclusions and offered recommendations for the improvement and maintenance of the current programs in order to foster a better financial literacy educational program.

Acknowledgements

This project would not have been possible without the assistance of the kind people at WPI and the surrounding area that we would like to thank.

We would like to thank all of the WPI undergraduate and graduate students who participated in our survey and interview process during the Fall Semester of 2016. We would also like to include the WPI alumni from the Classes of 2000 to 2016 who were emailed and those who participated in our alumni survey. We also would like to lend a generous thank you to the WPI IRB staff, especially Ruth McKeogh, all of who were incredibly helpful in addressing our concerns for survey approval. The WPI Office of Student Aid & Financial Literacy (OSA&FL) and the WPI Alumni Relations staff, especially Aubrey Valley and Peter Thomas, have our deepest thanks for supporting us and for distributing our survey to WPI undergraduates and graduates, and WPI alumni.

We would like to thank Kristin Tichenor WPI Senior Vice President, Jeffrey Solomon WPI Executive Vice President/CFO, James Valis WPI alumni, Financial Advisor, Owner, and Founding Partner of Blackstone Valley Wealth Management, and Kelly Lannan from Fidelity Investments for interviewing with us. We are grateful that they were able to lend us their time and support and to allow us the opportunity to hear their views on financial literacy and its education. A big thanks goes out to Rosemarie Alicea, Assistant Director of OSA&FL, and Jennifer Sheehy, Senior Assistant Director of OSA&FL, for their insight into the current initiatives and sessions offered for financial literacy education at WPI. We also thank the professionals, professors, and students who took the time to see our presentations and for providing us with helpful feedback.

In conclusion, we would like to thank our Project Sponsor Monica Blondin, the Executive Director of OSA&FL, for her countless hours in guidance and support throughout the project. We couldn't have asked for a better sponsor! And finally, our biggest thanks is reserved to our Project Advisor Fabienne Miller for her excellent guidance, corrections, patience, and support throughout the project. Your support through this project has helped to make it a success!

Executive Summary

Purpose and Scope:

We sought to investigate the level of financial literacy at WPI based on several factors and sought to find how to improve the financial literacy program at WPI, run by OSA&FL. Using the resources provided by OSA&FL, we began our research. Our goal was to first investigate the importance of financial literacy and how it can influence personal financial decisions. Second, we assess WPI students' understanding of personal finance, explore how to improve WPI students' financial literacy (capturing the information that students both needed and wanted to learn), and use our results to recommend changes in both financial literacy resources and sessions.

Financial literacy is a vital life skill, as it allows for individuals to execute better informed financial decisions and improve their financial judgement. Prior research shows that both high school and college students suffer from low financial literacy despite state initiatives conducted at the high school level (Mandell, 1999). These students would ultimately graduate high school and college and enter the financial world very poorly prepared. Moreover, a collective lack of financial literacy can even impact the economy in a negative manner (Hira 2012).

Reviewing literature, we were able to draw from the methods used by past researchers and also found ways to compare our data to theirs. We also noted that past literature did not assess the financial knowledge of STEM college students and address this gap with the current study.

After conducting this background research, our group devised the following research questions in order to guide our project:

1. What is the current state of financial literacy at WPI from a student's knowledge standpoint, including how past education has influenced current knowledge?
2. How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?

Background and Literature Review:

In order to become better informed on the topic of financial literacy and its apparent problem, we researched topics pertinent to our study. We found numerous articles from as far back as the late 1990s that helped us to first define personal finance and financial literacy, as we discovered that oftentimes, these two topics go hand in hand. Financial literacy is the basic ability to make sound decisions with regards to finance while personal finance is overall financial decisions regarding budgeting, insurance, mortgage planning, savings and retirement planning (Investopedia, 2003).

With these definitions in hand, we evaluated the importance of financial literacy by stating its place at the university and household level. We found evidence that financial literacy in college students is low, and that this typically translates over to life after college (Avard,

2005). Next, we looked further back at the problem surrounding financial literacy in reference to the educational issues surrounding the high school and college levels (Mandell, 1999). We found that initiatives to increase financial literacy at these levels led to mixed results suggesting that past financial education had little to no difference on financial knowledge of students after the fact.

We then investigated the implications low financial literacy could have on the economy and society. We found evidence that low financial knowledge is often associated with poor individual financial actions and choices (Hira, 2012). Those choices can then have a detrimental effect on the economy. We also found the current state of financial literacy in the United States to be unsatisfactory compared to other countries in the world (Council of Economic Education, 2016).

Finally, we examined solutions that could be implemented or improved on at our campus, Worcester Polytechnic Institute (WPI). To do so, we gazed past WPI's campus and searched for programs elsewhere in the country that have either increased financial literacy knowledge base, or been met with much positive reception from students. We found some solutions at the college level, with a model example stemming from Yale Law's Financial Aid Office.

We used this background research to test whether WPI students suffer from low financial literacy and to propose solutions adapted to college students. To propose these solutions we employed two specific methods.

Methods:

The two main methods of research used to aid our study were surveys and interviews. We administered the survey to undergraduates, graduates, and alumni. The surveys were built using previous survey questions and recommendations taken directly from the Jump\$tart coalition, OSA&FL, and a few other sources, we looked into. The basis for the survey was to gather input of students at WPI about their background, what they would like to learn, and also tested them on personal finance knowledge. Surveys provided us with a quantitative way to collect data from individuals.

Interviews, on the other hand, helped us to connect with undergraduate students, alumni, and financial literacy professionals. We looked to attain professional guidance and learn how those who were already graduated picked up the skills to become financially literate. Interviews also helped us answer questions that were not addressed in the survey. Interviews were conducted on a much smaller scale. Data collected from interviews were qualitative and helped us to seek answers to the research questions we created.

Results:

After the conclusion of our data collection we were able to find interesting results to our research question that perked our interest and also offered a few unexpected surprises. Subjects surveyed included: WPI undergraduates, graduates, and alumni. Subjects interviewed included:

WPI students, alumni, and professionals. All statistics were devised using IBM SPSS Statistics Data Editor.

A total of 1,288 students responded to the survey out of 4,261 undergraduate and graduate students. 1,110 of these surveys were completed and used in our analysis (26.05% response rate). For alumni, out of the 10,101 alumni that we distributed the survey to 602 responded (5.96% response rate). Other demographic responses can be found in full detail under our findings chapter. With data in hand we went ahead and analyzed our data remaining true to our research questions.

Our first research question looks to address the state of financial literacy at WPI from a student's knowledge standpoint. We first tested this information by asking students ten knowledge based questions worth one point each. On average, students scored 5.68 out of 10 points with a standard deviation of 2.15. Alumni performed better than students with an average score of 7.37. Several t-tests and analysis of variance tests enabled us to compare means. We found that freshman scored the lowest, followed by sophomores, seniors, juniors, and lastly graduate students. Furthermore, males performed better than females, domestic students scored better than international students, and white students outperformed other racial ethnicities.

We also studied the students' self-assessed knowledge compared to their actual score on the financial test. Surprisingly, we found students do not have a good indication as to how financially literate they are in comparison to how they actually perform. Additionally, we studied the difference in personal finance knowledge between Business School students and Engineering students. We found that past business course work is not associated with a higher score, suggesting that corporate financial knowledge does not translate to personal financial knowledge. However, what did influence results was prior personal finance education as students who had taken a personal finance course performed better than those who did not. We also compared the students who attended workshops with those who had not attended. We found no significant difference between those two groups. Lastly, we found evidence to support that older students or alumni performed better than students or alumni who were younger, suggesting that experience contributes to improving one's financial literacy.

Our second research question looks to address current WPI initiatives in terms of ways to improve both the content and how the content is brought to students. We found that most of our subjects found the following topics important to a strong foundation of financial literacy: Debt Management, Money Basics 101, and Student Loan Repayment. Our same subjects also wanted to learn more about Investing Basics, Debt Management, and Student Loan Repayment. Most individuals did not attend financial literacy sessions held on campus mainly due to forgetfulness, timing conflicts, and an already established knowledge base on the subject. Subjects found the following incentives appealing: WPI apparel/items, food, and raffles. Preferred methods of education for subjects included: workshops, online content, and guest speakers. Lastly, we found most individuals were free to attend sessions Wednesday evenings from 5-8pm. Data analysis is covered more in depth in our Data Analysis and Discussion chapter.

Recommendations:

Our overall recommendation is that the WPI financial literacy program's goal should aim to ensure that all students are financially literate upon graduation. To achieve this we make several recommendations, including an overall plan of action as well as implementable changes to the marketing and content of the sessions. It should be noted that we recommend our second plan of action more so than our first listed plan.

Our first recommendation for an overall course of action is a short term plan that specifically targets groups on campus that are not financially literate, such as international and freshman students. If financial literacy sessions were marketed especially to them, there is potential for WPI's average score on our knowledge based questions to rise.

Our suggested long term plan, which is our preferred plan, is a growth based plan for the current WPI financial literacy program. The concept is to not target certain groups, but make the program inclusive of all students, improve quality of the learning material, and most importantly, develop the need and importance of the program. When this is accomplished, an attainable goal would be for the financial literacy program to split from OSA&FL and become its own entity, in which all resources are focused on financial literacy. In order to make this plan effective, we recommend changes to marketing and content.

From a marketing standpoint, we recommend marketing the need for financial literacy more so than the content. Currently, marketing efforts are simply for students to know what the session is about, where and when the session is being held, and offered incentives. Although, we recommend that advertising not only contains what the session is covering, but why learning such information is important.

From a content standpoint, we recommend changing the topics of sessions to those which students selected as mattering most to them, including Debt Management, Money Basics 101, and Student Loan Repayment, and excluding topics such as Buying Your First Car and Buying Your First Home. We also recommend making content as interactive as possible in order to create a mock environment of real life experience. Finally, we recommend holding sessions on Wednesdays in the evening or afternoon, and offering WPI apparel as incentives to attend.

Future research on financial literacy education is something that will benefit in the growth of the WPI financial literacy program. One suggestion is to have a post survey after every financial literacy session asking students knowledge based questions from the session topic they just attended and asking them if they liked it and what could be improved upon. This data then could be used to track the current knowledge of students as well as the session's effectiveness of teaching the topic. It can also be used to continually have the student's input as to what they want out of the WPI financial literacy program. Collaborating with other schools, such as RIT, would be beneficial to gauge the overall current state of college students in the United States on their level of financial literacy. A long term study into the benefits of being financially literate would be interesting and useful to see the effects of financial literacy education. And finally, since our survey was not able to reach out to as many graduate students as we wanted to, a study done on graduate student financial literacy knowledge is another future research plan we would recommend.

Authorship Page

The contributing authors listed below assume full responsibility for the authorship and editing of this report. Their specific contributions are also included.

Mary Hatfalvi

Mary was the primary agenda and minutes taker throughout the project term. She contacted, scheduled and helped conduct interviews with students, alumni and professionals. She co-wrote the interview questions for students, alumni and professionals. She co-wrote the abstract and survey questions for alumni and students. She also helped to edit the Methodology chapter, construct the survey, and create data analysis questions. Furthermore, Mary edited and formatted References, wrote the Acknowledgments, and contributed by writing some research paragraphs in the Background and Literature review and parts of the Executive Summary. Finally, she contributed to the overall editing of the final report.

Shivam Mehta

Shivam was the primary survey and interview creator, and made significant contributions to editing and writing. He was responsible for a majority of the edits that were made to each section in the paper and also wrote sections of the Abstract, Executive Summary, the Background and Literature Review, the interview section of Methodology, and Conclusions and Recommendations. Furthermore, he directed and worked on most of the video construction that was created for use by OSA&FL.

Christopher Rodgers

Christopher was the primary data analyst for students and alumni. He also co-wrote and edited the Data Analysis chapter. He was also the primary interviewer for the professional and some student interviews. He was the primary writer of the survey section of the Methodology chapter. He co-wrote the Conclusions & Recommendations chapter. He was quality control throughout the project term. Finally, he contributed to the overall editing of the final report.

Suilio Simo

Suilio was one of the primary editors of the paper throughout the project term. He was responsible for revising most sections of the paper, but primarily focused his attention to the Introduction, Background & Literature Review, and Methodology chapters. He co-wrote the Executive Summary, Introduction, Background & Literature Review, Methodology, and Conclusion. He also organized some sections of the References with use of the program Pro Quest Ref Works.

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1.0 Introduction

Being financially literate has always been an essential life-skill, and today's day and age is no exception. The phrase financial literacy can be defined quite differently across the spectrum. Jump\$tart Coalition scribes the definition of financial literacy as "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being" (Jump\$tart Coalition for Personal Financial Literacy, 2015). Some common themes that we found in our research led us to define financial literacy as having general financial knowledge about one's own finances (i.e., personal finance) and, with this knowledge, being able to make informed financial decisions.

With a strong financial literacy ability, people are able to manage themselves and their finances and can also help to keep America competitive and to ensure financial sustainability (Rabbior, 2011). When a person does not have the basic financial knowledge to manage their personal finances, they are more prone to making nonsensical financial decisions, such as improper budgeting and spending. An example of this arises from the fact that student loans have increased, which creates financial burden on students after graduation. 62% of undergraduates that responded to an American Student Assistance survey stated that student debt creates hardship when combined with household spending (American Student Assistance, 2015). Personal finance education can help to mitigate these issues by educating people on smart financial behavior and by focusing on student loans and budgeting. Furthermore, both the individual and the economy may benefit from an understanding of financial literacy. Some researchers have argued that a link exists between the financial crisis and poor household economical practices (Hira, 2012).

The issue with financial literacy today is the overall lack of financial literacy and financial knowledge in the United States. Knowledge requires education, therefore it can be said that this problem stems in part from a lack of education. Currently, only a few states in the United States require high school education in personal finance. As a result, multiple surveys conducted in the United States have shown evidence of low financial knowledge of high school students. Specifically, in 1997, Mandell distributed a survey to high school throughout the country, and found that students on average answered only 57.3% correctly, regardless of prior education (Mandell, 1999). Moreover, Xiao shows that greater financial knowledge of students positively correlates with a decrease in risky financial behaviors (Xiao et al., 2014).

Formally, our objective was to find answers to the following research questions:

1. What is the current state of financial literacy at WPI from a student's knowledge standpoint, including how past education has influenced current knowledge?
2. How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?

Our objectives were informed by prior research and tailored to meet the desires of the WPI's Office of Student Aid & Financial Literacy, our sponsor, in terms of current financial literacy knowledge and financial literacy initiatives desired.

To help us to better understand the extent of the financial literacy problem among college students (the population our sponsor is trying to reach), we first surveyed WPI undergraduate and graduate students, as well as alumni to assess their financial literacy. We also captured the preferences of WPI students for specific delivery methods for financial education and the topics that they were most interested in. Second, we complemented surveys with interviews of students and professionals. Interviews enabled us to gather personal opinions, anecdotes, and information necessary for our study.

We find that WPI students are moderately adept with financial literacy. There are certain demographic groups who perform better than their counterparts, and alumni perform far better than students. We also find that both formal personal finance education as well as general life experience are contributing factors to an individual's level of financial literacy. We find that students are interested in several of the current topics being offered, and uninterested in others. We find that workshops and online content are the presentation mediums that students are most interested, and that sessions should be offered on Wednesday afternoons or evenings, with WPI apparel as incentive to attend.

Our findings may lead to new initiatives, or modification of existing programs that the WPI OSA&FL regularly conducts. The implications of our study include potential increased financial literacy amongst WPI students, and in turn improved financial decision making in the long term due to the new and/or improved initiatives offered at WPI. The increased level of financial literacy may also have positive impacts on the community, as well as the economy as a whole.

2.0 Background and Literature Review

2.1 Defining Personal Finance & Financial Literacy

2.1.1 Personal Finance

An important component of financial literacy is personal finance. Investopedia defines personal finance as “all financial decisions and activities of an individual or household, including budgeting, insurance, mortgage planning, savings and retirement planning” (Investopedia, 2003, p.1). The roots of personal finance can be traced back to times before currency or any formal systems, as the simple exchange of commodities is truly the basis of money. Over time, personal finance has grown in scope, and now includes financial concepts such as insurance, investment, and credit. Today, personal finance has become an entire industry, and people dedicate their careers to overseeing and advising personal financial decisions. In a sense, any individual can make these personal finance decisions, but to make key informed decisions one must possess a good level of financial literacy.

2.1.2 Financial Literacy

The WPI OSA&FL defines financial literacy as, “the ability to understand finance; more specifically it refers to the set of skills and knowledge that allow an individual to make informed and effective decisions” (WPI Financial Literacy Survey, 2011, p.8). Financial literacy encompasses a broad range of financial skills and knowledge and is incredibly important for everyday life.

2.2 The Importance of Financial Literacy

Why is financial literacy important? According to Wells Fargo’s CEO, John Stumpf, young people need financial literacy, as it “is crucial to both their individual economic security and our country’s ongoing prosperity” (Council of Economic Education, 2016, p.1). A background in financial literacy can allow an individual to make more informed financial decisions.

Financial literacy is especially important for college students because college itself is a tremendous test of financial management and decision making. Many students take out student loans to cover the cost of tuition, and knowing how to manage these loans is crucial to post-graduation financial well-being (“Adjusting to college,” 1990). It is also common for college students to live in off-campus apartments, where they must manage to living alone, bills, meals, and all other expenses that college students often must deal with independently for the first time during their college years.

However, financial literacy is important not only for young people, but for everyone who deals with money. Beverly et al. (2003) studied household financial management, collecting data on attitudes, expectations, and characteristics from a geographically representative sample of households, by phone. They noted that “knowing about credit, saving, and investment was

correlated with having higher index scores for credit management, saving, and investment practices respectively,” (Beverly et al., 2003, p. 321) which suggests that financial knowledge of households may have had a positive impact on their financial stability. In their discussion, it was also noted that consumers who were educated on the spot with topics pertaining to their situation were more likely to modify their behavior and practices (Beverly et al., 2003). For example, a person going through the process of purchasing a house, when well-versed in the financial aspects of home buying would be more likely to make a better purchasing decision. This is valuable insight that depicts the importance of studying relevant aspects of financial literacy in order to positively affect choices in financial practices. However, most people are not well versed in financial literacy and as a result are not always able to make the most financially sound decisions.

2.3 The Level of Financial Literacy

2.3.1 Level of Financial Literacy at High School

Interest in personal finance has increased significantly in high schools throughout the United States since the 1990s, as an attempt to increase the low level of financial literacy that has been documented by scholars. (Walstad, Rebeck, & MacDonald, 2010). For example, a personal finance survey was distributed by Mandell (1999) to 1,532 students at over 65 high schools nationwide and gathered results based on demographic and past financial knowledge. Of the 31 survey questions, students on average only answered 57.3% of the questions correctly. The study also noted that students who had personal experience in a particular field of personal finance scored no better than those who possessed little to no personal experience in the field. For example, students who paid auto insurance themselves knew no more on the subject than students whose parents paid insurance for them, or who couldn’t drive. Furthermore, they observed no link between socioeconomic status and financial knowledge. However, other demographics such as race had a small but significant impact on test scores and the geographical location of high schools also affected scores.

Overall, this study asserts that personal financial knowledge is low amongst high school students, perhaps suggesting that the state of financial literacy education in high schools may be the issue. And since high school students are particularly lacking financial literacy, the problem might carry over to the college level.

2.3.2 Level of Financial Literacy at College

In terms of financial literacy and college students, Xiao et al. have identified that nowadays college students have a general low level of financial literacy. Xiao et al.’s study surveyed college students during 2007 at a major, land-grant university that was left unnamed. The survey tested freshman students and obtained 2098 student responses, or 32% of the freshman class. The survey was based off of objective knowledge, content knowledge that can be demonstrated by a test score, and subjective knowledge, a self-assessed understanding of content. Xiao et al. found that on the subjective knowledge section, students scored an average of

3.16 points out of 5 total. On the objective knowledge section, students scored an average of 5.50 points out of 8 total (Xiao et al., 2014). Both of these scores display failing grades and demonstrate a low level of financial literacy in college students. This study will be elaborated on in the next few sections.

Much of this low level of financial literacy carries over from the problems sourced at the high school level. Furthermore, according to the WPI's OSA&FL's Assistant Director Rosemarie Alicea:

“Students are so focused on academics and don't always set time aside to take a closer look on how they can better manage their finances while in school. Students may think that it is something that they need to hone in on once they graduate, but for now not a necessity as many of their financial obligations are maintained by parents or student loans.” (November 22nd, 2016)

In sum, most students may be too preoccupied with their individual studies to focus in on researching information finances that may influence them later in life. Yet, after college students are thrown into the workforce and forced to confront newfound financial obligations with little or no background. This can result in poor decision making and negative consequences for both the individual and the economy.

2.4 The Implications of a Low Level of Financial Literacy

Lacking financial literacy can cause individuals to make irresponsible financial decisions. In terms of the financial knowledge of students, conclusions were reached in Xiao et al.'s 2007 study, which examined the link between financial knowledge and subsequent financial behaviors. Thanks in part to a small monetary incentive, the findings incorporated responses from 81% of students in a sample consisting of 32% of the freshman class from an unspecified university (Xiao et al., 2014). Xiao et al. found that there was a positive correlation between a higher GPA and subjective knowledge and generally less risky financial behavior, though the study did not demonstrate a causal relationship. The methods did attempt to control for some factors such as general intelligence and demographics, which revealed some significant associations between behavior and things like gender identity and GPA. The most significant conclusion indicated that students with greater subjective knowledge tended to exhibit less risky financial behavior. Yet, since financial literacy is lacking across the board, financial decision making will be quite poor and as a result will exhibit negative impacts on the individual.

Hira (2012) also examined the methods by which a lack of financial literacy education can negatively impact an individual's life, but added that these poor decisions can ultimately induce adverse trends in the economy. The housing and mortgage crisis was an example of this effect when, “businesses aggressively sold ... mortgage products and mortgage-based securities to people who neither understood nor could afford them” (Hira, 2012, p. 502). This suggests that the financial industry contributed to the economic recession by exploiting consumers who lacked the level of financial literacy needed to make sound decisions. Lack of financial knowledge can affect not only an individual's personal life, but also the economy.

On a global level, a study conducted by the Council for Economic Education suggested that the United States lag behind in financial literacy education compared to other countries.

Eighteen countries participated in a comprehensive assessment of financial literacy in 15-year old students, and American students finished ninth. Questions on this assessment were related financial skills required to be literate in the 21st century, and certain questions allowed for partial credit depending on the answers. Results from this study suggest that America's poor performance demonstrates a need for greater financial literacy education. That said, the study did not offer significant suggestions nor substantial findings on how to improve scores or national financial literacy (Council of Economic Education, 2016). Even so, many steps have been taken to mitigate this problem.

2.5 Initiatives at the High School Level

An economic study conducted in 2016 by the Council for Economic Education shows that certain initiatives have been taken to increase financial literacy at the K-12 levels, but they are not yet widespread as there has been a slow growth in personal finance education in the current years. State legislators and lobbyists around the country have taken action, and there have been a few reforms in regards to state educational standards. Mainly, two additional states have required their standards to include personal finance. The study also shows that as of January 2016, seventeen states require some type of personal finance education in high schools, with five of these states requiring a standalone, semester long course on this topic. These initiatives appear to have been effective in the past. For example, in 2007 legislators passed a mandate for financial literacy education in high schools in Georgia, Texas, and Idaho. Average credit scores for people younger than twenty-two in these states have risen seventeen, twelve, and eight points respectively as of 2016 (Council of Economic Education, 2016). However, the effectiveness of these programs has not been fully tested for every state and in particular tests many issues with initiatives have also been noted.

Personal finance education exists. The question though is whether this education is effective. Several studies conducted in the 2000s which compare the knowledge of financially trained students to that of untrained students display weak correlation between high school finance education and financial literacy. For example, "one such study using Jump\$tart test scores from 2000 through 2006 reported that high school seniors who took a full-semester high school course in personal finance had average scores that were no higher than all seniors who took the test" (Walstad, Rebeck, & MacDonald, 2010, p. 337). The expectation here would be that training in personal finance allows students to score higher than those who were not exposed to any personal finance education. A survey conducted by Avarad in 2005 also sought to prove this expectation wrong. Texas is one state in particular that has mandated personal finance education. Avarad administered the survey in 2003 at Texas A&M University, whose student body was 86.8% Texan at time. (Texas A&M University, 2005). The twenty-question survey on finance was distributed to 407 students enrolled in a freshman English class, 82.3% of which reported having taken a financial course in high school. In theory, if high school mandated education were effective, students would perform relatively well. Still, the students' average score was 34.8% on the comprehensive assessment. Each question was weighted the same and covered a different financial topic including, for example, financial planning, income level, mutual funds, and blue chip stocks. This study demonstrates low knowledge in the personal

finance area even though a majority of the sample had been exposed to personal finance courses (Avard, Manton, English, & Walker, 2005). A portion of the students' low scores can be attributed to the fact that certain questions were outside of the scope of the average college freshman, such as retirement funding and home buying questions. Also, there is no available comparison for how students who did not have mandated education may have done on the assessment. Included in the test was a "Don't know" option, which reduced the effects of guessing as a confounding variable. The "Don't know" option was utilized more times by students who had never taken a personal finance course than those who had, which shows those who had taken a class previously were less unsure of their answers. Overall, the studies by Mandell and Avard were able to validate the fact that students with previous personal finance courses in high school are not financially literate.

If these courses are ineffective, what is wrong with them? In Rabbior's 2011 book on Case Studies of International Financial Initiatives, he argues that financial literacy education is ineffective due to a lack of interest and poor training of financial literacy teachers. Mandated financial literacy courses are uncommon in the United States, which provides little opportunity and incentive for teachers to learn how to teach financial literacy. Rabbior continues to state that teachers in the United States receive training that is designed around job prospects, opportunities, and pay in order to become teachers. If personal finance is not mandated or widely accepted as a necessary subject or opportunity, training in personal finance will be less invested into and less available to teachers. As a result, teachers will not look to the subject as a field of education that they would want to pursue (Rabbior, 2011). We took these state educational issues into account at the high school level and next focus on learning about ways of improving teaching of personal finance beyond high school at the college level.

2.6 Initiatives at the College Level

Certain institutions offer financial literacy education. In our search, we targeted a range of schools that have both a similar academic curriculum to WPI and a successful financial literacy education programs as indicated by their financial aid websites. The model universities that we found were Yale University, Rochester Institute of Technology, and Stanford. Yale University, besides having financial literacy workshops and a financial literacy blog, offers one-on-one sessions for their students as they see it as a better way to get individual solutions to each of their students personal financial situations (Yale, 2016). According to an article on Yale's Financial Aid Office website, Jill Stone who is Director of Financial Aid at Yale Law School, says that it is Yale's Financial Aid Office's responsibility to make sure that students will make the best financial decisions when they are enrolled and after they graduate. Since they started offering individual financial literacy counseling sessions in 2012, their enrollment for the sessions have grown to needing a waiting list (Yale, 2016). Rochester Institute of Technology (RIT) provides its students with a Financial Literacy program, which uses a website called BalanceTrack (RIT, 2016) to run online lessons with chapters and quizzes. They do not offer any financial information sessions. The topics of Financial Literacy that they focus their online curriculum on are budgeting, account management, savings and investing, credit and identity theft (RIT, 2016). Stanford University provides a new Financial Literacy Program that includes

presentations with guest speakers and incorporates an online program called CashCourse (Stanford, 2016), that students can log on to for free and that is promoted to help with building financial skills (CashCourse, 2016). The topics they focus on are budgeting, savings, credit, banking and loans. All of these universities indicate that they find budgeting, saving, credit, and loans important topics for students to know about, by offering resources in those areas.

Peng et al. (2007) take a look at the impact of financial literacy past the high school and college level. The study investigated the influence that college and high school personal finance classes have within student alumni lives. The survey tested alumni on the financial knowledge of their savings practices by asking if they had taken a course covering consumer education. Among the alumni who responded, 19.9% had participated in a college level personal finance course and 17.4% had participated in a high school personal finance course. On average, five out of the ten questions were answered incorrectly on the financial knowledge portion of the survey. However, Peng et al. was able to find that those who had taken a college course outperformed those who did not in terms of investment knowledge and concluded that college courses offer a more lasting influence than that of high school courses. They did not, however, find evidence that financial education correlates with high scores in investment knowledge. In sum, this study showed that receiving a personal finance education in college may be an effective way to master personal finance. Below, we examine initiatives WPI has taken to improve the financial literacy of its students.

2.7 Initiatives at WPI

In 2011, WPI's OSA&FL created and distributed a survey to students on the subject of financial literacy education. Over a thousand students responded to the 2011 survey with at least 30% support in a financial literacy education workshop to be offered (WPI Financial Literacy Survey, 2011). As a result, the former Office of Financial Aid recognized the need for improving financial knowledge and renamed itself OSA&FL in July 2015 to further pronounce this fact. In turn the office's focus accounts for said need. As explained by project sponsor Monica Blondin, the mission of the financial literacy initiative is to enhance financial literacy mainly amongst students, faculty, and staff. Monica Blondin is the Executive Director of OSA&FL, and is one of the leaders in her office's campaign to complete this mission of improving WPI students' personal financial knowledge. The financial literacy initiatives offered by WPI OSA&FL cover topics including budgeting, loan management, credit, investing, buying a home, saving, insurance, and identity theft (WPI OSA&FL, 2016). WPI offers several resources for students to get educated in these categories including seminars, fairs, and written information on finance. It is the office's desire that we find ways to increase attendance and usage of these events and resources. Attendance has ranged from 8-284 attendees. (WPI OSA&FL, 2016). From this insight into WPI's current state, we gathered together our research and formulated our main purpose to our study's investigation.

In sum, we have determined there to be an issue with financial literacy at the high school and college level. We have seen that this issue can create widespread negative effects in life after college, as more and more financial decisions are loaded into life. Therefore, we examined the initiatives made at the high school level and have found ourselves questioning the effectiveness

of them. However, as we look more and more towards college, we have decided that steps taken at the college level tend to resound more with the student, as they begin to realize that sheltered college life is coming to an abrupt close. As a result, we have made it our goal to find methods to take financial literacy education at WPI and improve upon it.

3.0 Methodology

The goal for our project was to find ways to improve financial literacy education at WPI by discovering what students need to know and what they want to know about financial literacy. The following research questions were informed by prior research and developed to guide our study:

1. What is the current state of financial literacy at WPI from a student's knowledge standpoint, including how past education has influenced knowledge?
2. How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?

To answer these questions, we utilized two research methods: surveys and interviews. Surveys were the primary method of data collection. Interviews were conducted before and during survey distribution for preliminary discovery into financial literacy and after survey distribution to confirm findings and fill in missing information from survey data. Survey and interview questionnaires were designed to address our research questions.

The content of the interview and survey questionnaires was reviewed by our Project Sponsor Monica Blondin and Advisor Fabienne Miller, and also compared to past surveys that we analyzed. We obtained overall approval to conduct our research by the Institutional Review Board (IRB). This board reviews all studies to ensure proper protection for human subjects involved in research.

3.1 Surveys

The first research method we used was surveying. According to Floyd J. Fowler of UMass Boston's Center for Survey Research, a survey is a research method designed to provide statistical descriptions of a desired population by asking questions of a smaller sample from said population. Also, "the main way of collecting information is by asking people questions; their answers constitute the data to be analyzed" (Fowler, 2014, p.1). In respect to our study, we surveyed in order to provide a statistical description of the state of financial literacy at WPI, and to analyze the data procured to address our research questions. As a result, the test we wanted to produce contained standard descriptive statistics, various associations between certain demographics, background characteristics, a level to gauge financial literacy, and a need for financial literacy sessions.

3.1.1 Justification for Surveys

Surveying is an appropriate method to test our stated research questions, as there are numerous advantages. One such advantage is *ease of application*. Surveys are produced in an inexpensive and time efficient manner. Our survey was administered through email, and distributed to the 4,166 undergraduate students and 125 graduate students at WPI who have financial aid. Additionally, the WPI Alumni & Advancement Office helped us by administer the

alumni survey to 10,101 alumni. Our goal for alumni responses was 50 people since they are not the main study for our research, we also did not anticipate how many alumni we would receive. Our goal for students was to acquire 1,000 responses. Our goal for the alumni responses was to get confirmation and affirmation on our findings in the student survey. Consistent with prior research using surveys, our goal for a response rate on campus was at least 10%, which would yield roughly 440 responses between graduates and undergraduates. According to Duncan Nulty of Griffith University, a survey of similar size to our own would require a much smaller response rate than 10% to be considered to have an 80% confidence level. Therefore, attaining a response rate greater than 10% would place our survey above the 80% confidence interval, with an ideal confidence interval for our survey being above 90%. Our *location* also provided us with an advantage. We were confident that we could reach our goal being located on a college campus, which is convenient for several reasons. First, college campuses are a prime location to administer online surveys as students are constantly receiving and reading emails. Secondly, WPI students are project oriented and therefore are more likely to be willing to participate in other students' projects such as the IQP. Another advantage of surveying is *data collection breadth*. Surveys are versatile in the sense that they are functional for collecting data from knowledge-based questions, as well as opinion-based questions. Our study looked to find both types of information.

Surveying has also been utilized and *proven effective in past studies*. One such study, conducted by Peng et al. (2007), used a 46-question survey with questions on investment knowledge, savings, financial education, financial experience, and income & inheritance, as well as demographics. The survey was administered to 12,000 people with a 12.4% response rate. The survey's success can be partly attributed to the large pool of people that received the survey, but more importantly to the fact that the right questions were asked in a manner that was appropriate in testing the study's hypothesis, something we have attempted to replicate.

Another study which utilized surveys was that of Xiao et al. (2014). The survey used a Likert scale to ask questions such as "How would you rate your overall understanding of personal finance" using a ranking system from 1 to 5, with 1 being "very low" and 5 being "very high". The specific limitation of this survey is that these questions were opinionated in the sense that one respondent may have a different sense of what a 1, 2, 3, 4, or 5 response may represent, and responses may have been inconsistent as a result. This survey was extremely successful in its response rate, 81%, in part because a monetary gift was given to respondents and as a result, findings could be asserted with greater confidence.

One final study that we examined was that of Avard et al (2005). The survey, administered to college freshmen at Texas A&M University, asked 20 knowledge-based questions on a variety of financial topics. The questions were particularly challenging and students scored very poorly, receiving an average score of 34.8% with six students even scoring 0s. The positive aspect of this study was the fact that the questions were knowledge-based, and therefore tested financial literacy. The issue, though, was that the questions were too challenging and topics were not realistic for college freshmen who have not taken a personal finance class, such as purchasing life insurance and mortgages. As a result, we toned down the difficulty of our own questions, and modeled them off of topics that college students would find relevant.

OSA&FL already had a list of topics that they believed were important for college students to know and this list was used to model our survey question topics.

Each of these surveys had both positive and negative aspects, and we looked to incorporate the positive facts into our surveying while keeping the negatives in mind. During survey creation and distribution, in particular, we worked to ensure that we had a large enough sample size like Peng et al. (2007) and ask knowledge-based questions like Avard et al. (2005), provided that the questions were realistic for our respondents to be able to answer. We constructed our survey with the guidance of our Project Advisor and Project Sponsor, who were both able to assist us in creating and editing our questions to best tailor to our population. Furthermore, the survey was tested with a few students, to ensure fluidity and gauge reactions.

3.1.2 Limitations of Surveys

There are various limitations to surveying. First, *poor survey construction* can ruin a study. If questions are not well scripted, formatted, or ordered, data may be compromised. Questions cannot be constructed in a manner to influence the respondent one way or another. Moreover, questions must allow for the respondent to fully address an issue and/or fully state their opinion on the matter.

Other issues with surveys include *response problems*. First off, survey responses cannot realistically be fact checked. Respondents may lie for various reasons, such as answering a certain question in a deceiving manner to make him/herself appear to be a good person. This phenomenon may even occur subconsciously. Again, the overarching issue with this response problem is that there is no way to check the validity of answers. For this reason, survey results cannot be taken with an absolute certainty. Uncertainty in findings is, to some degree, a part of every study so proper question construction to eliminate response issues is imperative. Another response issue is in the pure nature of who responds to the survey, as response bias occurs. Those who may be more passionate about financial literacy may be more likely to respond to the survey, and vice versa. As a result, data may be skewed and not accurately represent the entire population (Fowler, 2014).

Finally, survey *responses are not guaranteed*. For example, Peng et al.'s (2007) study had a 12.4% response rate, which may seem low in other realms, such as test scores, but is standard in surveying. In order to achieve an ample number of responses, a large pool of potential respondents must receive the survey.

3.1.3 Execution of Surveys

The information collected can be categorized into one of three subsections: *demographic and background information*, *financial knowledge*, and *educational delivery methods*.

The *demographic information* includes status (year in school including option to answer as a graduate student/alumni/professional working in finance-related field), gender, age, major, racial heritage, and domestic/international student status. These questions did not directly answer our research questions but were useful in drawing conclusions and associations following data analysis. Furthermore, they helped to evaluate whether our sample was representative of WPI students, our population.

The *background information* section asked questions to understand the subject's current background with financial literacy education, student loans, and their general awareness of campus events, such as financial literacy events. These questions were used to make recommendations to OSA&FL.

This section asked *knowledge-based questions* on financial literacy. These questions assisted in answering our research question on the status of student financial literacy knowledge, and allowed us to potentially find association between demographic or background information and scoring on knowledge-based questions. The specific areas of financial literacy that we aimed to target with this section were money basics, debt management, finance after college, investing basics, credit, student loan repayment options, budgeting, and savings. The section was graded and each question was worth 1 point with a total of 10 questions for 10 points. The score was displayed to respondents at the end of the survey, with correct answers highlighted in green. Furthermore, we included a reference to OSA&FL to accompany the results.

The survey was designed to be particularly useful for OSA&FL, as questions were tailored to find information focused on attendance at the office's financial literacy events. In particular, the *educational delivery method* section collected information on what days and times of the week students would be most likely to attend, what makes them attend, their preferred method of education in terms of financial literacy, and what type of content they are seeking in a financial literacy education event. Ultimately, these questions have aided in answering our second research question.

One final question in this section asked if the subject was willing to be interviewed as part of our survey follow-up process. A thank you message with our contact information was displayed at the end of the survey. Surveys and messages can be found in Appendix A.

Questions within each category were grouped together, and categories were ordered on the survey as listed. Some questions contained sub questions based on survey taker responses. Sub questions were created using loop and skip logic in Qualtrics. The surveys were created to take about 10-15 minutes to complete and were designed to capture the appropriate amount of data needed to satisfy our research questions without being too long. After our survey was created, we went ahead and found a method of distribution for our subjects respectively.

Surveys were administered through an emailed link to Qualtrics, a survey outlet. For WPI students, we emailed the survey to all undergraduates and graduates with financial aid. The message was distributed under the Financial Aid Office's name and email since they have access to all students with financial aid and because we would not have been able to distribute the survey as widely since WPI students are typically barred from mass emailing. For alumni, Ms. Blondin provided contact for us with the Office of Alumni Administration. In order to generate a greater response rate, OSA&FL offered an incentive to respondents in the form of WPI gear/apparel. Subjects were offered the opportunity to provide their name and email address in a separate survey (with no connection between their contact information and their responses in the main survey) in order to be entered into a raffle. Ten winners were randomly selected by assigning numbers to the respondents and using a random number generator to pinpoint the winning numbers/subjects. Winners were referred to OSA&FL to collect their prize from sponsor Monica Blondin.

In order to provide detail and confirm our surveying findings, our second instrument included interviewing. Questions were reflected off of what we asked in our surveys to expand upon in our surveys, additionally any data we missed in our findings. The goal of our interview process was to test our conclusions based on survey data, as well as fill in any gaps in our study that the survey could not answer. Thus, information collected by our interviews was determined by questions that we wanted.

3.2 Interviews

The second research method we used was interviewing. The fundamentals of an interview can be classified as “generating and maintaining conversations with people, or the interviewees, on a specific topic or a range of topics and interpretations made by the social researcher, or the interviewer, on the resultant data” (May, 2010, p.2). According to *Social Research* authored by Tim May in 2010, there are four distinct types of interviews. They are as follows: structured interviews, semi-structured interviews, unstructured or focus interviews, and group interviews. We conducted semi-structured interviews for each representation of our subjects (undergraduates, alumni, and professionals). A semi-structured interview involves an interview schedule, which is a preset list and order of questions to be asked in the interview. The interviewee is also allowed the freedom to initiate conversation with the interviewer, and deviate from the schedule. The interviewee can be allowed a broader reign with the questions in this type of interview and is allowed to digress if they so desire.



Figure 1: Shivam, Suilio, and Mary interviewing Kelly Lannan, Fidelity Investments

3.2.1 Justification for Interviews

Interviews are beneficial to our project, as they offer a variety of positives, such as *flexibility*. Interviews can be conducted at any stage of our data collection (Brewerton, 2001). Interviews were administered before the survey was administered to gain insight and spread the

word on financial literacy, during survey data collection to supplement surveys and after data collection, which enabled us to gather personal opinions, anecdotes, and information necessary to supplement data. Semi-structured interviews provided us with both quantitative and qualitative data. The structured elements of semi-structured interviews were effective in gaining quantitative data and the flexibility that exists within the unstructured elements allowed for additional insight into the answers of the interviewee and therefore provided qualitative data (May, 2010). Still, due to the small number of interviews we have conducted we do not have enough data to conduct quantitative analyses. Therefore interviews will primarily look to collect qualitative data.

Our interviews also allowed for *probing*. If applicable, questions that were answered could have been elaborated upon by us or the interviewee, which allowed us to attain additional insight into our topics. Furthermore, this increased the validity of their answers, as they were able to provide us with additional information to clarify their responses (McLeod, 2014).

We are also able to gather *perspective* from interviews. An ideal method of understanding the financial literacy knowledge of students at WPI, or lack thereof, is to view the subject from their perspective. In contrast to our surveys, the interviews allowed us to gauge some form of expression or emotion in the way that the interviewee's words were spoken, such as sarcasm, passion, dismissiveness, etc. We were able to assess this by how they talked and conducted themselves during the interview and made note of these characteristics during the interview. Some participants felt strongly about certain aspects of the subject and as a result displayed more care and concern for a particular field of financial knowledge than another one. Therefore, a large part of our focus on interviews consisted of interpreting sayings for usage as qualitative data on the matter. Our data also compared across multiple interviews, and patterns on particular interests were established.

3.2.2 Limitations of Interviews

There are several general limitations to interviews. Firstly, for us, we are not interview experts. Conducting proper interviews is a precise skill that we have not yet trained to mastery. There is potential for data to be flawed as a result. A skilled interviewer would possess the skills necessary to probe when applicable and guide the interview (McLeod, 2014). Therefore, our probing could also be compromised. To counteract this, we asked our Project Advisor and Sponsor for some aid in interviewing skills. Moreover, certain information can be sensitive and/or confidential, and interviewees may not have felt comfortable answering questions of a certain nature. For example, a question on income could cause an interviewee to refuse answer. To alleviate this, we provided ranges that they could comfortably answer to, such as prefer not to answer questions regarding age, level of financial literacy, etc. If the issue arose where the interviewee was uncomfortable or refused to answer the question, we factored out the response to the question. Furthermore, because interviewees are allowed, to some extent, to float from one topic to another, these interviews could become increasingly lengthy. We avoided this by not straying from the topics and questions being asked.

Limitations of video recording are also prevalent. May's book describes two disadvantages: interaction and transcription. The former relates to the potential that the interviewee does not wish to have their interview recorded. Transcription, or the act of

transcribing the film to typing/notes can also be a disadvantage in relation to time, especially if numerous interviews are to be transcribed. The process can result in being very long and tedious (May 2010). Our study conducted numerous student and professional interviews. Thus, we took into consideration the timing constraints we faced when interviewing. We were able to utilize technology in the form of both sound recording and video recording to mitigate some of these limitations.

3.2.3 Execution of Interviews

Our interview process served as the follow-up process to surveying. In particular, we tested our preliminary survey findings, and attempted to fill in any gaps in our research that needed further data. As a result, the number of people being interviewed was dependent on our follow-up needs. The number of questions was also dependent on what information we still needed or wanted to explore additionally. In general, interviews took no longer than 30 minutes, and Ms. Blondin gave our group permission to schedule interviews in the Bartlett Center. In terms of random subjects found in high traffic areas at random, they were either interviewed on the spot or brought to the most convenient location. Subjects did not need incentive to participate, but food was offered for the student interviews. Finally, we also attempted to record interviews. Interviewees were only recorded on video/sound with consent, as in accordance with IRB standards. Subjects needed to sign a release form. Recording made data collection from the sessions easier, and provided us with tangible materials for OSA&FL. If subjects were not willing to be videotaped, but were willing to be sound recorded, we sound recorded the interview.

In order to choose subjects, we utilized convenience sampling. For our purposes, we interviewed students and financial professionals such as those working in OSA&FL and utilized a semi-structured interview style. The target population is college students, and our target sample was *WPI students*. Our target sample for *professionals* was anyone working in finance, in particular those on WPI's campus and our target sample for alumni was *WPI alumni* who were willing to be interviewed. There was a question on the survey asking if subjects were willing to be interviewed during the follow-up process, which aided in finding interview subjects. Otherwise, we sought out subjects in high traffic areas such as the Rubin Campus Center, or found subjects through the assistance of OSA&FL.

For *WPI students*, we initiated interviews with casual conversation. We then began the interview with a general introduction of the interviewer and project, interviews commenced by asking the subject a little background about their level of financial knowledge and their financial education background. We then addressed the types of financial knowledge that students were most interested in learning, if applicable to the student. In this regard, we were able to dig further into the reasons why subjects wanted to learn financial literacy in specific ways. The interview was then concluded with any additional comments and questions that we or the student may have had. See Appendix B for student interview questions.

Throughout the project, we also interviewed *professionals* such as people associated with finance-related offices on campus, as well as other professionals. One such professional that we wanted to interview was Yale's Law School Financial Aid Director Jill Stone because she started

a successful financial literacy program at the Yale Law School and had done her own research on the matter. This interview was scheduled to be conducted through a video chat. Unfortunately, due to Yale's policies and protocols on how Yale's name is used or cited in public materials, she could not be interviewed. An example of professionals on the WPI campus we interviewed were two members of OSA&FL in charge of financial literacy initiatives. We gathered data on how effective they believe current initiatives to be, and their own thoughts on the matter of financial education at the college level in general. Lastly, we also interviewed the WPI Chief Finance Officer, Jeff Solomon, and the Senior Vice President of WPI, Kristin Tichenor. The purpose of these interviews was to gather opinions from people in the upper echelons on campus, and to spread word of the financial literacy initiative at WPI. The interviews were semi-structured so as to allow them to speak at length, while still allowing us to retain an interview schedule. Refer to Appendix B for professional interview questions.

A *WPI alumnus* was also interviewed to collect his opinions on WPI financial literacy initiatives and whether or not they were overwhelmed by the financial aspect of life after college. Due to the timing constraints of our research, the alumni survey was sent out at a late time of our study. As a result, we were only able to conduct one interview with alumnus Jim Valis. Interviews with alumni should be considered at a much smaller scale when talked about throughout the report. The interview with Jim Valis began with a question on what he believes his financial literacy level is on a scale of 1 to 5, followed by a question how he got to be to that level. From there, questions about finance and financial literacy initiatives were asked (see Appendix B). The Interview with Jim Valis was semi-structured to allow him to speak in length about his financial experiences and if he would have preferred to learn more about finance while they were still in college, as opposed to having to self-educate as a post-graduation adult. Furthermore, we followed up by gathering some additional intelligence on sources of financial aid knowledge that he procured himself that may be helpful to the project, and for the benefit of others.

3.3 Timing

Our project began October 25th of 2016 and ran until December 15th of the same year. The project was conducted and completed during A- and B-term of the 2016 Fall Semester. Figure 1 depicts a Gantt chart created by the team for the B-term for the purpose of outlining the timing for various components of data collection and data analysis as well as report writing. We made it habit to stick to the Gantt chart and update it as necessary in order to complete all tasks in a timely manner. Figure 2 shows the legend to the Gantt chart is displayed below the chart. Through the timed application of these methods, we were able to gather data and information pertinent to our research. This collection of results was then put into analysis in order to explore the implications of our data.

4.0 Data Analysis and Discussion

Data collection was conducted by surveying WPI undergraduate and graduate students, as well as WPI alumni and by interviewing students, alumni, and professionals in the field of finance. We first present results from surveys: our analysis includes descriptive statistics and addresses our research questions with inferential statistical testing. Statistical tests were performed through the IBM SPSS Statistics Data Editor. Data Legends can be located in Appendix D.

4.1. Student Survey

4.1.1 Survey Demographics:

Our survey was sent to 4,261 undergraduate and graduate students, of which 1,288 students responded. However, 178 students (13.82%) did not fully complete the survey all dropping off with varying completion percentages. Adjusting for those who did not complete the survey, our survey was completed in full by 1,110 subjects, which equates to a 26.05% response rate.

In terms of who received the survey, the survey was sent to 4,123 full-time undergraduate students, accounting for 97.84% of the full-time WPI undergraduate population. The survey was also sent to thirteen part time students, and 125 graduate students. The percentage of graduate students who received the survey is far lower than that of the undergraduate population, as there are 868 full-time graduate students and over 2,000 part-time graduate students at WPI (WPI Division of Enrollment Management, 2016, p.3).

The survey was sent via email by OSA&FL to students receiving financial aid. The survey was 31 questions in length (see Appendix A). In terms of how long students took to finish to the survey, the average time (outliers removed) was 8.32 minutes. This was lower than our estimated timeframe of 10-15 minutes.

The following data describe our sample: 49.01% were male and 49.37% were female, with 1.62% responding “Other” or “Prefer not to say”. 71.89% of students were 19-24 years old and 25.32% were 18 or under. In terms of class, students were 30.9% freshmen, 24.77% sophomores, 18.83% juniors, 23.24% seniors, and 2.25% graduate students. 72.07% of students identified their racial/ethnic heritage as White, while smaller percentages identified for other racial heritages. Students were in a wide variety of major fields, with the most frequently selected majors being mechanical engineering (19.86%) and biomedical engineering (12.00%). Finally, respondents were primarily domestic students, at 92.88%. Detailed results are presented below in Table 1.

Table 1: Survey Sample Demographics

Gender			Racial Heritage		
	N	Percentage		N	Percentage
<i>Male</i>	544	49.01%	<i>White</i>	800	72.07%
<i>Female</i>	548	49.37%	<i>Hispanic or Latino</i>	119	10.72%
<i>Other</i>	9	0.81%	<i>Black or African American</i>	30	2.70%
<i>Prefer not to say.</i>	9	0.81%	<i>Native American or American Indian</i>	3	0.27%
Class			<i>Asian/Pacific Islander</i>	110	9.91%
	N	Percentage	<i>Other</i>	30	2.70%
<i>Freshman</i>	343	30.90%	<i>Prefer not to say.</i>	18	1.62%
<i>Sophomore</i>	275	24.77%	Age		
<i>Junior</i>	209	18.83%		N	Percentage
<i>Senior</i>	258	23.24%	<i>18 or under</i>	281	25.32%
<i>Graduate</i>	25	2.25%	<i>19-24</i>	798	71.89%
Domestic/International Status			<i>25-35</i>	19	1.71%
	N	Percentage	<i>36-45</i>	5	0.45%
<i>Domestic</i>	1031	92.88%	<i>46 or over</i>	2	0.18%
<i>International</i>	70	6.31%	<i>Prefer not to say.</i>	5	0.45%
<i>Prefer not to say.</i>	9	0.81%			

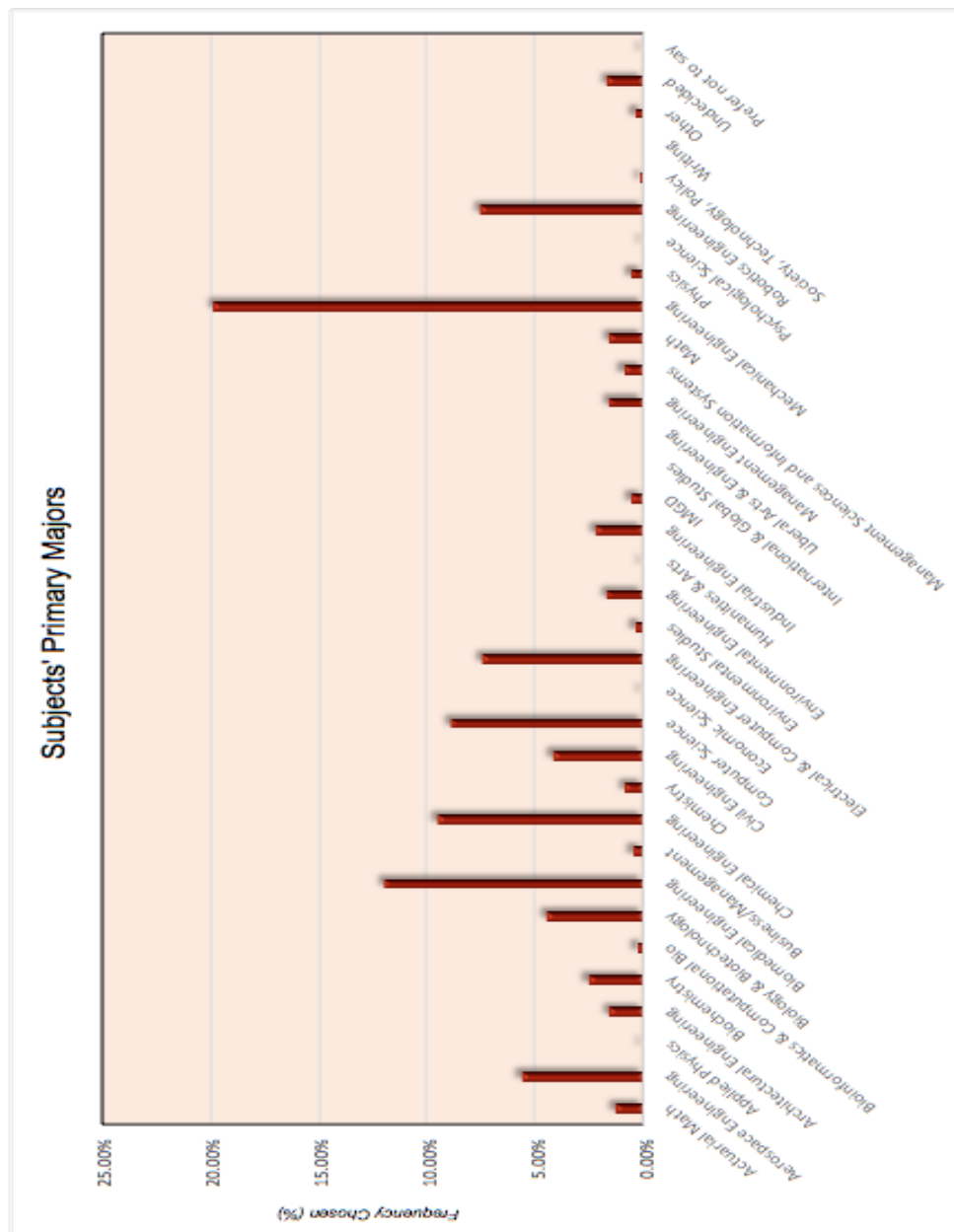


Figure 4: Primary major of survey sample.

Table 2: Survey Sample vs. Population Demographics

Gender			Class		
	Actual Population Percentage	Sample Percentage		Actual Population Percentage	Sample Percentage
<i>Male</i>	65.49%	49.01%	<i>Freshman</i>	20.94%	30.90%
<i>Female</i>	34.51%	49.37%	<i>Sophomore</i>	19.83%	24.77%
<i>Prefer Not to say/Other</i>	n/a	.62%			
Racial Heritage			<i>Junior</i>	17.71%	18.83%
	Actual Population Percentage	Sample Percentage	<i>Senior</i>	24.44%	23.24%
<i>White</i>	55.73%	72.07%	<i>Graduate</i>	17.08%	2.25%
<i>Hispanic or Latino</i>	7.80%	10.72%	Domestic/International		
<i>Black or African American</i>	2.34%	2.70%		Actual Population Percentage	Sample Percentage
<i>Native American or American Indian</i>	0.31%	0.27%	<i>Domestic</i>	78.31%	92.88%
<i>Asian/Pacific Islander</i>	3.64%	9.91%	<i>International</i>	21.68%	6.31%
<i>Prefer not to say/Other</i>	n/a	4.32%	<i>Prefer not to say.</i>	n/a	0.81%

While our survey population was entirely from WPI, the sample was not entirely representative of the WPI population. For the fall 2016 semester, WPI was composed of 66% male and 34% female. Although WPI does not offer data on the ages of students, the vast majority of college students fall into the 19-24 age bracket. Class breakdown for undergraduates is about 25% freshmen, 24% sophomores, 21% juniors, and 29% seniors, while graduate

students make up roughly one third of degree seeking students at WPI. White students make up 62% of the population. There is even greater disparity in declared majors in reality compared to our sample, although mechanical engineering is the most studied major at WPI. International students make up approximately 10% of undergraduate students, and nearly a third of graduate students. (WPI Division of Enrollment Management, 2016). Data comparing sample and population demographics is presented below in Table 2.

Findings and data analysis regarding specific demographics will be clearly stated as to what they are referencing. Analysis and findings are structured in reference to our research questions, beginning with research question #1.

4.1.2 Research Question #1:

Recall that research question #1 asks, “What is the current state of financial literacy at WPI from a student’s knowledge standpoint, including how past education has influenced knowledge?” This question will be answered by testing subjects’ financial knowledge. The first part of RQ1, addressing student knowledge, is discussed in sections 1.2.1, 1.2.2, and 1.2.3. The second part of RQ1, addressing past education’s part in student knowledge, is discussed in section 1.2.4. Investigated in section 1.2.5 is the effect of life experience, which will be used to contrast findings based on education. Finally, section 1.2.6 will include MANOVA testing in order to predict performance.

4.1.2.1 WPI Students’ Overall Performance on Financial Literacy Questions

To address the current state of students’ financial literacy, we investigated their personal finance knowledge. Our survey included ten comprehensive questions on various financial literacy topics to measure student knowledge (see Appendix A). A correct answer was scored as a 1, and an incorrect answer or “I don’t know” response was scored as a 0, and the sum of these scores was taken. Students were encourage to use the “I don’t know” option when faced with a question they were unsure on, so as to avoid skewing data with lucky guesses. The assessment was scored out of 10 points, meaning a score of 8 would equate to an 8/10 or 80%.

Of the 1,110 WPI students who completed the survey and received a score, the average score was a 5.68 out of 10, with a standard deviation of 2.15. The average score of 5.68 was significantly lower than 6.0 ($t = 4.954$, $p < .05$). Scores ranged from 0% correct to 100% correct.

The use of “I don’t know” also varied with students’ class type. Typically, upperclassmen and graduate students were less unsure of their answers than underclassmen. Of the total “I don’t know” responses for all ten knowledge based questions, 33.75% belonged to freshman, and 31.76% belonged to sophomores, resulting in almost two thirds of the total “I don’t know” responses belonging to underclassmen. Juniors used “I don’t know” less than seniors, 15.16% and 18.40% respectively. Furthermore, graduate students displayed the least amount of usage of “I don’t know”, with only 0.94% of their answers belonging to that category.

Using independent sample two-sided t-tests, scoring was also analyzed in regards to several demographic distinctions. Students selecting responses such as “Prefer not to say” were excluded from particular demographic analyses. The 544 males (5.84 mean score) performed

slightly better than the 548 females (5.53 mean score), with a statistically significant difference in means ($t = 2.371$, $p < .05$). The difference in means between the 1,031 domestic students (mean 5.81) and 70 international students (mean 3.91) was also statistically significant ($t = 7.353$, $p < .05$). The difference in scoring between the 618 underclassmen (mean 5.27) and 492 upperclassmen/graduate student (mean 6.20) was also statistically significant ($t = 7.343$, $p < .05$). Students who described their racial or ethnic heritage as white (800 students) also scored better (mean 6.05) than any other racial identification (306 students total), all of which scored below an average score of 5 in their individual group's mean score. This difference in means between white students and all other racial identifications was statistically significant ($t = 9.554$, $p < .05$).

In sum, in contrast with prior literature, we found evidence that students' overall performance is different between several major demographic groups. Although there were distinctions between demographics, we also wanted to determine where students thought their own financial literacy levels resided.

4.1.2.2 WPI Students' Perception of their Financial Literacy vs. Actual Scoring

We investigated whether students' perceived knowledge of financial literacy translated to similar performance on comprehensive questions. Personal finance is a field with a vast array of facets. Thus, students may be unaware of their lack of knowledge in certain areas, and therefore may not feel the need to seek education. In our survey, Q7 asks the subject to rate their financial literacy on a scale from 1-10, 10 being expert level (see Appendix A). This question comes prior to any knowledge-based testing questions, and far before the subject sees their scoring on said questions. The average level of self-rated financial literacy amongst all subjects was 5.72, not far from the mean score of 5.68 on scoring ($t = .536$, $p = .592$). When interviewing, students were asked whether or not their self-rating would change after answering the knowledge base questions. Their answer was usually yes and they would mark themselves down by 1 to 2 points. In conclusion, students were not overly confident in their knowledge of personal finance.

To test whether there was a correlation between individuals' perceived knowledge and scoring we used a Pearson correlation test. This test examined the association between students' comprehensive question score and their self-score on financial literacy, with results showing a small, positive statistically significant correlation ($r = 0.348$, $p < .05$). In conclusion, students have only some small indication as to how financially literate they are in comparison to how they actually perform on comprehensive testing.

We next tested to determine whether or not a student's degree program affected their financial literacy.

4.1.2.3 WPI School of Business vs. WPI School of Engineering Performance

To do so, we investigated whether students taking courses in the Foisie School of Business performed better than students who were not taking any coursework in the business school. Foisie Business School students have a differing curriculum compared to other students at WPI. Of course, the student's chosen major(s) and minor(s) determine course requirements, but generally speaking, business school students are more likely to take classes that encompass finance, economics, and other subjects that would theoretically make a student more financially

literate. However, corporate finance and economics courses cover different concepts than personal finance. Thus, it is unclear whether students who have taken business courses will be more finally literate than students who have not.

In our survey, Q29 asks what the subject is studying in terms of major(s) and minor(s) (see Appendix A). The question provides a drop down box for the subject's first major, and then a second drop down box for an additional major or minor. These options allowed us to see who is a business school student, and who is not taking courses in the business school programs. Accompanied with their scoring on the comprehensive questions, we were able to test whether one type of student performed better.

To test, we used an independent sample one-sided t-test comparing scores of those who listed either a major or minor in the Foisie School of Business as one of their degree programs (Business/Management, Industrial Engineering, Management Engineering, and Management Information Systems) versus students who listed other majors/minors. For the reasons suggested above, we had no specific prediction regarding the performance of the 60 business school students surveyed compared to their 1,050 counterparts. Results showed that there was no significant difference between these means (5.57 for business students, 5.69 for other students, $t = -0.420$, $p = 0.670$). In conclusion, acknowledging the low power of our test, the past knowledge obtained through business school coursework which is related to corporate finance does not seem to be associated with an improvement of students' understanding of personal finance.

To further investigate the effect of prior knowledge, we decided to look at the effect of past education as a whole.

4.1.2.4 Prior Education & Influence on Knowledge

We investigated if students who had a prior form of personal finance education, such as a high school class, college coursework, or a WPI-offered financial literacy session performed better than those without such background. In our survey, Q2 asks the subject if they have taken a personal finance course before. Q5 asks if the subject has attended a WPI financial literacy session, and if so, how many and what the topics were (see Appendix A). Testing whether responses on past education affect financial literacy scoring can be used to analyze if high school or WPI offered education is effective, and which may be the better of the two. Students responding with answers such as "I don't remember" were excluded from analysis in this section.

First, using Q2, we tested whether students who took a past personal finance course had higher financial intelligence test scores compared to those with no such background. Using an independent sample one-sided t-test, we found that the difference in means, 6.09 for the 219 students who had taken a personal finance course and 5.63 for the 865 who had not, was statistically significant ($t = 2.865$, $p < .05$).

Second, using Q5, we tested if those who attended personal finance sessions offered by OSA&FL performed better than those who did not. Only students who responded that they were aware of sessions in Q4 were asked this question. We used an independent sample one-sided t-test, with the prediction that those attending sessions would perform better than those who did

not. We found that the mean scoring of the 119 students who had attended (mean 6.3) was not significantly different than the mean score of the 589 students who knew of the sessions and did not attend (mean 6.02), ($t = 1.413$, $p = 0.079$).

It is worth noting that the topics of our questions and the topics of the offered financial literacy sessions at WPI are not the exact same. Certain questions may not be addressed by sessions, while simultaneously sessions may cover topics that are not tested in our survey. Since there are topics that are covered in both our survey and in a session, we investigated the following question: Do students who attended sessions on a specific topic perform well on questions based on the said topic?

One session topic offered by OSA&FL is insurance, which we also had a question on (Q17). 23 students reported having attended a session focused on insurance, while 639 students who knew about the sessions did not attend. Using an independent sample one-sided t-test, the difference of means in scoring on Q17 between those who have attended an insurance related session and those who have not was calculated. Acknowledging the low power of our test, we found that there was no statistical difference between the means of the two groups (mean .74 for those attending, mean .63 for those not, $t = 1.082$, $p = .140$).

We cannot conclude that attending a financial literacy session makes students more apt to answering knowledge-based questions on the session topic correctly. We can conclude that students who take personal financial literacy courses in their past are more financially literate than those not taking the course.

Our next area of testing concerned the effect that our subjects' age and experience had on scoring.

4.1.2.5 Financial Literacy and Age & Experience

Is financial literacy something that can be truly learned through formal education, or is real life experience the true educator in this realm? Kristin Tichenor, WPI Senior Vice President, when asked about her financial literacy education and how she came to be financially knowledgeable in an interview with the team, explained, "I think most of [financial literacy learning] is life experience, and some of it is making mistakes...it takes time and experience." Intuitively, the older one becomes, the more life experience they have. Therefore, we investigated if factors such as age and life experience contributed to financial literacy knowledge.

In our survey, we have several questions which address age & experience in different ways. The first is Q1, which asks what class (or graduate student option) the student identifies as. The second is Q28, which asks for the age bracket that the subject falls into. To test, we performed several inferential statistical tests. As previously stated in section 1.2.1, we performed independent sample t-tests comparing underclassmen (freshmen & sophomore) scoring to upperclassmen (junior & senior) and graduate student scoring. To reiterate, the difference in mean scoring between 618 underclassmen (mean 5.27) and 492 upperclassmen/graduates (mean 6.20) was statistically significant ($t = 7.343$, $p < .05$).

We also performed an independent sample two sided t-test comparing the scoring between age brackets "18 and under" and "19-24". 97% of students fell into these two age

brackets. The difference in means (mean 5.24 for “18 and under”, mean 5.82 for “19-24”) was also statistically significant ($t = 3.919$, $p < .05$) between the 281 “18 and under” students and the 798 “19-24” students. It should be noted that this inferential test was very similar to the underclassmen and upperclassmen/graduate test, as many of the respondents fall into similar categories.

It needs to be stated that these age brackets do not do well in differentiating between older college students and younger college students, as it is typical for a freshman to be both 18 and 19 years old. Although, the supporting data that a difference in means between underclassmen and upperclassmen is statistically significant supports the assertion that age also leads to greater financial literacy.

4.1.2.6 MANOVA Testing for Analysis with Controls

We found that both a past personal finance course as well as life experience have a positive effect on scoring. Can scoring on financial literacy comprehensive questions be explained by whether people have taken a personal finance course or have more experience, controlled for factors such as gender, race, or national origin?

Using MANOVA testing, we found that taking a prior financial literacy course and life experience do have a significant effect on the level of financial literacy of students, controlled for gender, race, and national origin (p -values all $< .05$ except for interaction). Specific statistics are listed in Table 3.

Table 3: MANOVA Testing SPSS Output

Dependent Variable: fnsh_SCO					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	807.773 ^a	17	47.516	11.984	.000
Intercept	2286.869	1	2286.869	576.754	.000
gender27	17.263	1	17.263	4.354	.037
white_vs_other	234.683	1	234.683	59.188	.000
domestic_inter31	76.739	1	76.739	19.354	.000
fincourse2	47.012	2	23.506	5.928	.003
class1	43.104	4	10.776	2.718	.029
fincourse2 * class1	13.583	8	1.698	.428	.905
Error	4313.992	1088	3.965		
Total	40769.000	1106			
Corrected Total	5121.766	1105			
a. R Squared = .158 (Adjusted R Squared = .145)					

4.1.2.7 Conclusion

In answering the research question, “What is the current state of financial literacy at WPI from a student’s knowledge standpoint, including how past education has influenced knowledge?”, for students, we have interesting results. Overall, students at WPI are more financially literate than students at other institutions who we have researched in prior literature, such as students at Texas A&M featured in Avard’s study. We also found several factors that contribute to one’s level of financial literacy, including past education on personal finance and life experience. We also found that certain factors do not contribute significantly to the level of financial literacy, such as business school coursework. We will seek further findings in answering research question #2.

4.1.3 Research Question #2:

Our second research question is, “How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?”. This question now looks beyond scoring and instead focuses on what students want to learn, why students want to learn, how they want to learn, and when. The first part of RQ2, specifically addressing how students feel about financial literacy session content, is discussed in sections 1.3.1 and 1.3.2. The second part of RQ2, addressing the methods and variations of delivery methods that students would like to use, is discussed in sections 1.3.3 and 1.3.4.

With our graphs, labels/topics on the x-axis are presented in the original order that they appear in the survey.

4.1.3.1 What Topics WPI Students Are Most Interested In

We first investigated what financial literacy topics matter to students, and what topics students wish they knew more about. Currently, WPI OSA&FL cites nine topics that they choose to focus on. These are Debt Management, Money Basics 101, Developing a Spending Plan, Buying Your First Car, Building Your Savings, Student Loan Repayment options, Managing Credit, Buying Your First Home, and Investing Basics.

In our survey, Q18 and Q19 address student interests (see Appendix A). In particular, Q18 asks subjects to rank the topics that matter most to them, with the option to write-in other topics. Q19 asks subjects to rank what topics they wish they understood better, again with the option to write-in other topics. These questions are similar in nature, and both address the issue of what students want to learn.

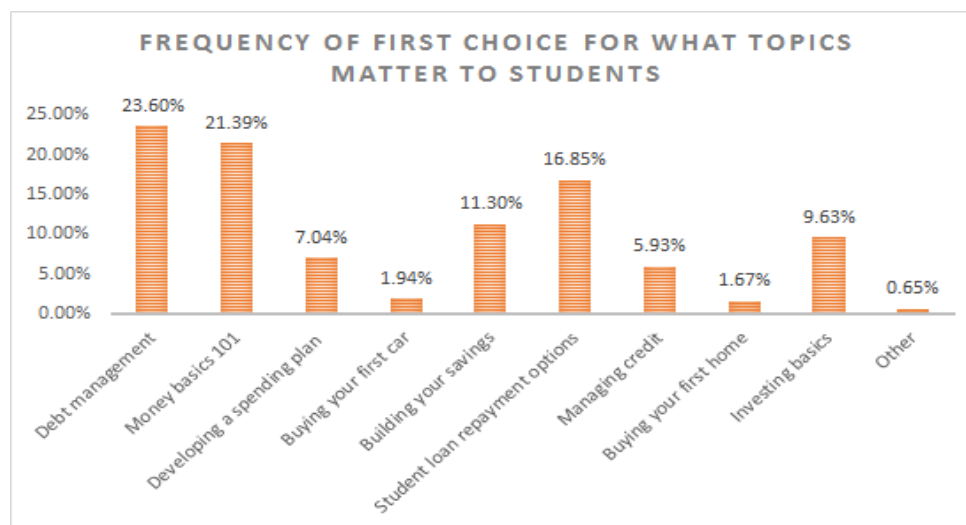


Figure 5: The frequency by which specific topics were chosen by students as the most important.

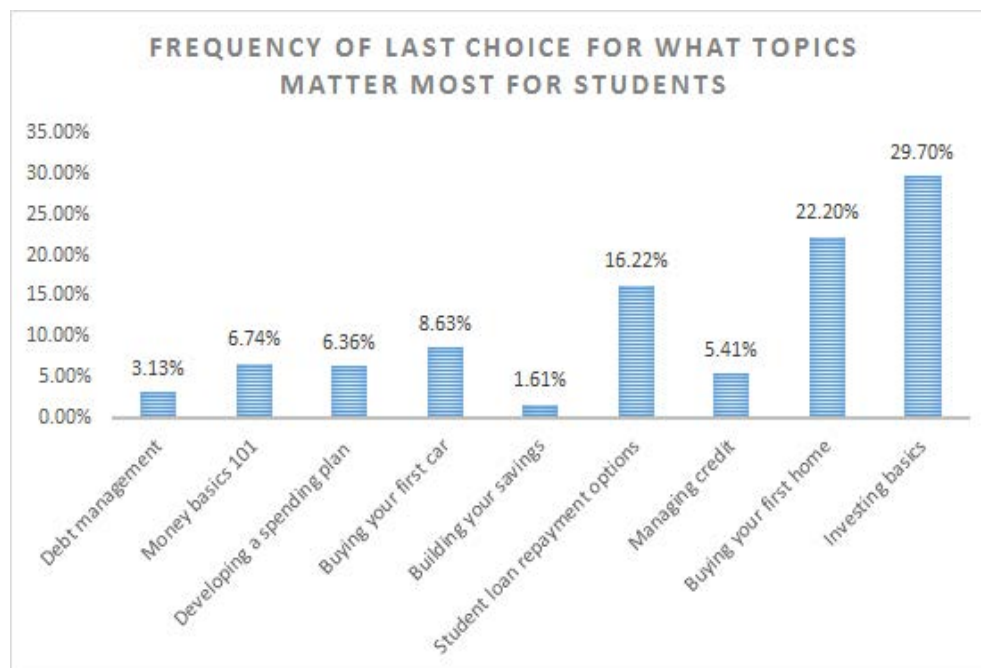


Figure 6: The frequency by which specific topics were chosen by students as the least important.

In terms of what topics matter most to students, the most common top answer according to Figure 5 was Debt Management (23.6% of students made this their first choice), followed by Money Basics 101 (21.39%) and Student Loan Repayment options (16.85%). In terms of what mattered the least to students, the most common selection according to Figure 6 (other than the “Other” option which required a write-in and was the primary last choice at 95%) was Investing Basics (29.7%), followed by Buying Your First Home (22.2%).

It should be noted that in Q18, twelve students (1.1%) did not change the rankings in any way, although in theory, the options may have already been in the rank order they would have chosen. On Q19, 29 students did not change the rankings at all (2.6%). That being said, students generally did not change the original order dramatically, leaving many of the choices in their default position. The following graphs display the responses provided by the survey takers. It should be noted that Debt Management was the first choice to begin with, meaning students who chose to not change the rankings at all or only made slight modifications and move on to the next question automatically selected Debt Management as their first choice, perhaps biasing our results. Still, we also observe that Debt Management was also the most common second choice, and a very common third and fourth choice. Students who were interviewed also reiterated the fact that Debt Management was important for them since “we all take out loans and loans can get complicated”, and “it’s [student loans] important to understand before you graduate” and that they “don’t want to get screwed over for loans.” These various observations are consistent with our interpretation that Debt Management is the most important topic for WPI students. Similarly,

Investing Basics was the default last choice, again perhaps biasing our results. The most common write-in suggestions were taxes and retirement.

Q19 focused on which topics students desired to know more about, and answers differed from what they thought was most important. According to Figure 7, the most common top choice for what students wanted to know more about was Investing Basics (21.96%), followed by Debt Management (19.27%) and Student Loan Repayment options (16.34%). Investing Basics being the top selection suggests that investing may mean more to students than Q18's data may have suggested.

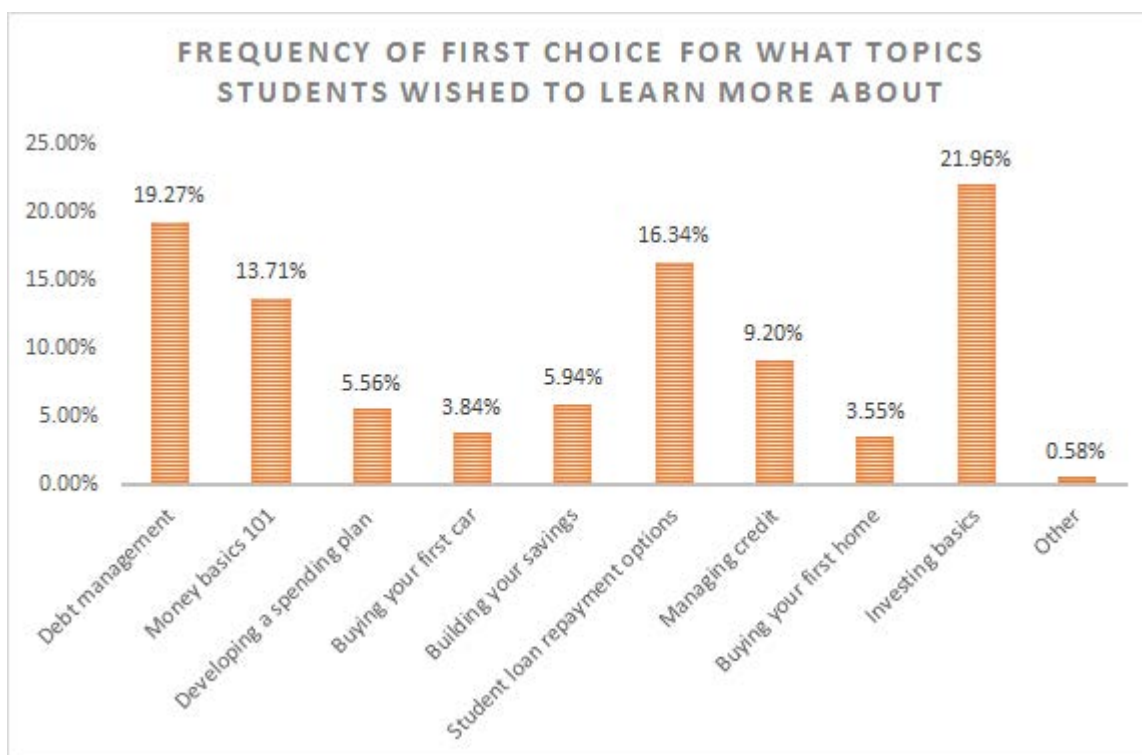


Figure 7: The frequency by which specific topics were chosen by students as the one that they wish they understood better.

In terms of what students did not wish to know more about, save for “Other”, Investing Basics was also the top choice (28.8%), suggesting many students did not change the rankings much or even at all. Otherwise, Buying Your First Home was a very common low choice for what students want to know more about (21.71%). Similar to Q18, common write-in suggestions included taxes and retirement.

These responses lead directly into determining why students attended sessions. It is possible that some topics relate more to certain students than others do, and that these sessions are attended more frequently as a result. Thus, we look to understand why sessions are attended and what could help raise their attendance.

4.1.3.2 Why Students Attend Sessions

Before starting on why students attend sessions, we decided to learn why students *do not* attend sessions. Although current attendance at financial literacy sessions is not low, it could always improve. Students who do not attend might not know about the sessions, might forget about the sessions, or choose not to attend. In our survey, Q5 asks if subjects have attended a session. If the student has not, they are then asked for reasoning as to why they have not attended, including a place to write-in a response. Question 5d, the specified follow up question to Question 5, and its choices are represented below in Figure 8.

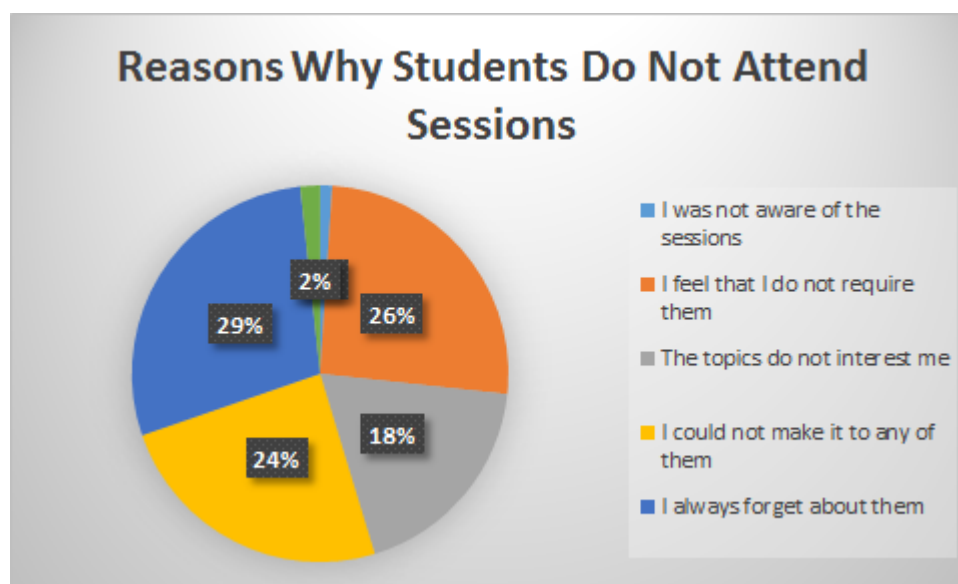


Figure 8: Reasons as to why students do not attend financial literacy sessions.

In terms of why students are not attending sessions, the reasons vary, with the most common responses being that students forget about them (29%), or that students feel they do not require them (26%). Furthermore, write-in responses include the notion that students are not prioritizing the sessions (i.e. too busy, homework more important) or that other outlets are better for them. When asked this question in the student interviews, students would say that “I am busy”, “I wish they were more frequent so that I had a chance to make one”, or “I don’t see the need for it”. Therefore, we are able to see that OSA&FL is able to advertise the sessions well, but should perhaps send reminder emails out closer to the time of the session. However, there is not much that can be done to appeal to students who simply cannot make it, other than creating new outlets of educational outreach, all of which will be discussed in the Conclusions and Recommendations chapter.

Furthermore, in Q25 represented by Figure 9, subjects are asked to rank what would best incentivize them to attend a session, again with the option to write-in a response. 143 (12.9%) students did not change the rankings at all, although this percentage is high, the risk of students not taking the time to give their actual preference is lower than with previous questions as there

are only four options and therefore a higher chance that the original order is representative of the subject's actual thinking.

Common write-in responses included that knowledge itself was a very important incentive (i.e. sessions being informative and well run was enough) and food, other than pizza, as pizza is always offered at events of this nature. Students asked in the interviews said that they would go if the information was relevant to them. Otherwise WPI apparel is the most appealing choice of incentive (63%) and would most likely raise attendance at sessions, should more of it be offered as giveaways. But there is another thing to think about: are sessions the most sought after outlet?

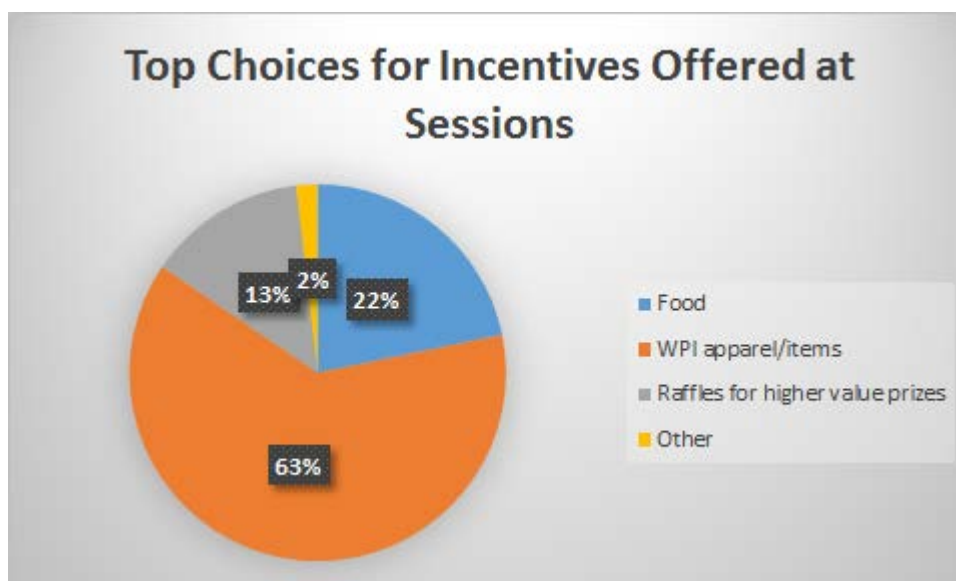


Figure 9: The frequency at which certain incentives were ranked in the number one spot.

4.1.3.3 What are the Preferred Methods of Education for Increasing Financial Literacy

Therefore, we investigated how students want to learn about financial literacy. Currently, the WPI OSA&FL only offers financial literacy workshops and the occasional large fair. WPI offers a personal finance course, but only during one of the four terms of the academic year. In our survey, Q23 asks subjects to rank various delivery methods, with the option to write in another option (see Appendix A). Question 23 is represented in Figure 10, which displays how frequently each option was selected as first and how frequently each option was selected last. The list of options being ranked include initiatives that WPI is currently utilizing, as well as methods they are not using (one-on-one coaching).

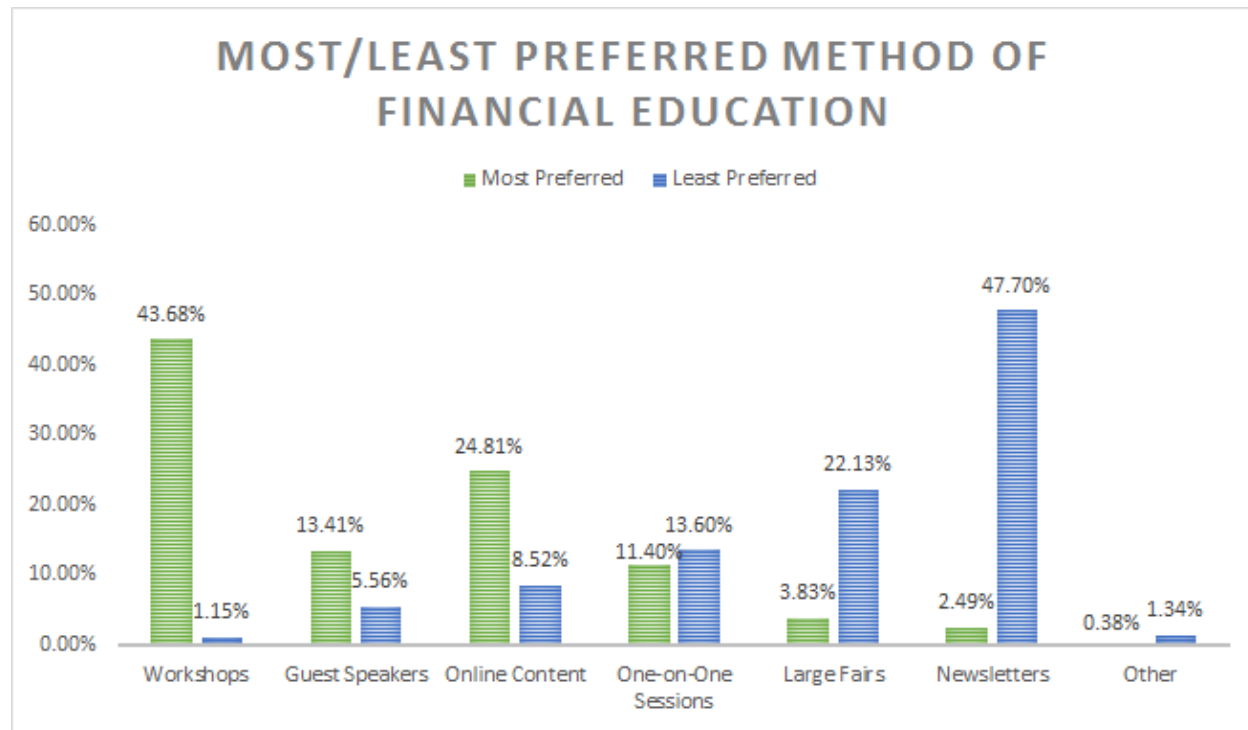


Figure 10: The frequency students chose certain educational outlets as either their most or least preferred method of learning.

In terms of the most preferred method of education, the most common first choice was workshops (43.68%) (which was the default first choice) followed by online content (24.81%). In terms of the least preferred method of education, save for the “Other” option, the most common response was newsletters (47.70%) (again the default answer) followed by large fairs (22.13%) and one-on-one sessions (13.6%). There were very few meaningful write-in options, including several nonsensical responses.

In Q23, forty-five students (4.1%) did not change anything. The last choice graphs follow a linear path, perhaps suggesting that students were not truly ranking the choices with much diligence. Another limitation can stem from the fact that Question 23 was placed near the end of the survey, meaning that students may have simply skipped it, or given it little thought to complete the survey faster. Still, students’ first choice does not follow that linear pattern.

One method that is not currently being used by OSA&FL is one-on-one coaching. In Q24, we ask who the subject’s ideal “coach” would be for a session of this nature (see Appendix A). While one-on-one sessions were only preferred by 10.7% of the students, prior research has found the method to be very popular at other universities such as Yale University. In Q24, data were collected as to who the ideal “coach” would be for such a session (see Appendix A). This is displayed with a first choice frequency in Figure 11.

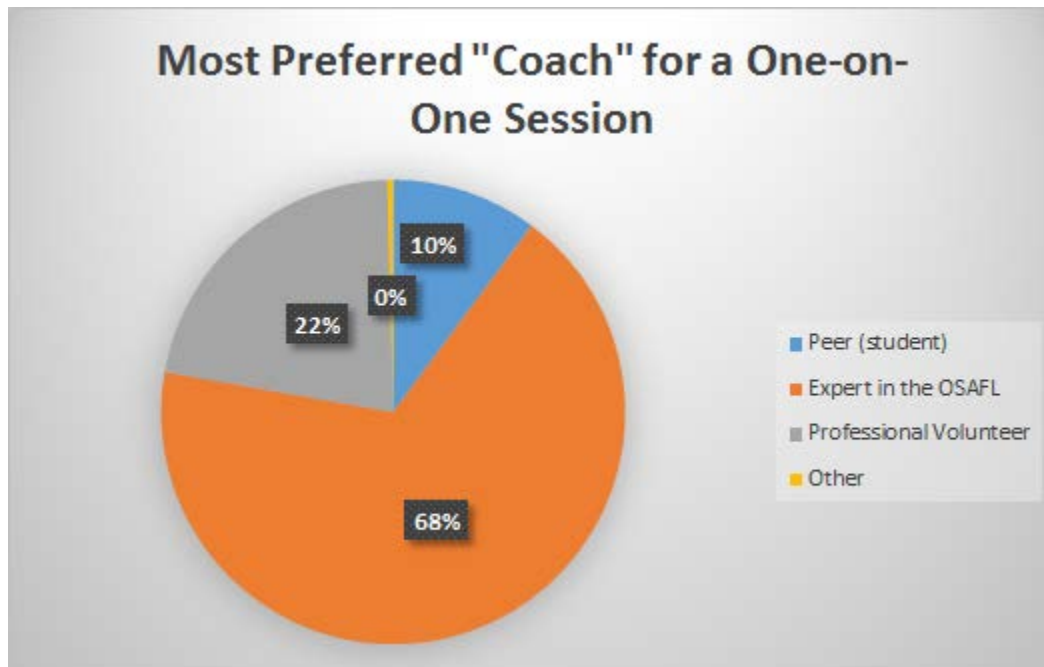


Figure 11: The frequency at which students chose a certain individual as their ideal one-on-one session “coach”.

The resounding first choice was for a professional in OSA&FL to be the coach (68%), with professional volunteer being the most common second choice (22%). Although “peer” was the default first choice on the survey, this option was less popular than the professional options in terms of first choice. Furthermore, it was selected as the last choice by 69.0% of the students. As some students put it “A peer does not come out as professional. And an expert would be more effective”.

Seeing as how this question was answered thoughtfully even though it was placed near the end of survey gives us slight reassurance that students may not have been rushing through the survey as much as we thought (in Q24, 75 students (6.8%) did not change the order of the responses).

Our final area of research related to delivery methods was to determine the time that students would be best willing to attend sessions.

4.1.3.4 When (Day, Time of Day) do Students Want Sessions to be Offered

Sessions at WPI could be the greatest financial literacy sessions any college has ever seen. However, if scheduled at the wrong times their quality is meaningless. Deciding on times to hold sessions is a large issue for OSA&FL. Students may not be able to attend sessions due to classes and other commitments, depending on when the sessions are held. Therefore, we investigated what were the best days and times for students to attend financial literacy sessions. As mentioned above, of the 634 students who knew about sessions and did not attend, 260 (41%) students cited that not being able to make it was a reason for their absence. Attendance could likely increase at events if seminars were scheduled at the right time.

Q20 asks what day of the week is best for sessions to be held, and Q21 asks what time of day is best for sessions to be held. Table 4 below displays the data found, with the three most popular time intervals in bold. In general, students reported varying times with the most popular day being Wednesday, and the most popular time being in the evening, followed closely by the afternoon. The specific most popular time slot given was Wednesday evening. Students could select more than one preferred day and more than one preferred time.

Table 4: Preferred Time Slots

Time of Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
Morning (9am-noon)	72	68	123	62	51	57	53	195
Afternoon (noon-5pm)	178	214	388	224	120	170	152	620
Evening (5pm-8pm)	219	247	460	260	162	205	192	692
Total	330	376	708	392	239	303	279	

4.1.3.5 Conclusion

When answering the research question, “How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?” for students, we have interesting results. We found the session topics that matter to students such as Debt Management and Money Basics 101. We also found that students’ preferred learning method is workshops, although there is also a desire for online content. In terms of incentives, we found students want WPI apparel/items. Finally, we found that the best time to offer sessions is Wednesday evenings or afternoons. We will seek to further investigate this question, as well as research question #1, for alumni.

4.2. Alumni Surveys

We administered surveys to alumni. We were looking for the same information that we were looking for from students, save for some information about sessions that no longer apply to those who have graduated.

Table 5: Survey Sample Demographics

Gender			Racial Heritage		
	N	Percentage		N	Percentage
<i>Male</i>	357	59.30%	<i>White</i>	508	84.39%
<i>Female</i>	232	38.54%	<i>Hispanic or Latino</i>	23	3.82%
<i>Other</i>	6	1.00%	<i>Black or African American</i>	7	1.16%
<i>Prefer not to say.</i>	7	1.16%	<i>Native American or American Indian</i>	2	0.33%
Age			<i>Asian/Pacific Islander</i>	31	5.15%
	N	Percentage	<i>Other</i>	10	1.66%
<i>18 or under</i>	36	5.98%	<i>Prefer not to say.</i>	21	3.49%
<i>19-24</i>	100	16.61%	Domestic/International Status		
<i>25-35</i>	354	58.80%		N	Percentage
<i>36-45</i>	88	14.62%	<i>Domestic</i>	556	92.36%
<i>46 or over</i>	18	2.99%	<i>International</i>	29	4.82%
<i>Prefer not to say.</i>	6	1.00%	<i>Prefer not to say.</i>	17	2.82%

4.2.1 Survey Demographics

Our survey was sent to 10,101 alumni, of which 637 responded. 43 of these respondents also listed him/herself as a professional working in the field of finance. However, 35 alumni (5.49%) did not complete the survey with varying completion percentages. Adjusting for those who did not complete the survey, our survey was completed in full by 602 subjects, which equates to a 5.96% response rate. In terms of who received the survey, the survey was sent to alumni from the classes of 2000 to 2016 by the WPI Alumni Association. There were twenty five questions on the survey (see Appendix A), which is six questions shorter than the student survey. On average, it took alumni 7.07 minutes to finish the survey (outliers removed). This was lower than our estimated timeframe of 10-15 minutes, and was lower than student response time. The following data describe our sample: 59.3% were male and 38.54% were female, with 2.16% responding “Other” or “Prefer not to say”. 58.80% of alumni were 25-35 years old and 16.61% were 19-24. 84.39% of alumni identified their racial/ethnic heritage as White, while smaller percentages identified other racial heritages. Finally, respondents were primarily domestic students, at 92.36%. Detailed results are presented below in Table 5.

4.2.2 Research Question #1

Recall that research question #1 asks, “What is the current state of financial literacy at WPI from a student’s knowledge standpoint, including how past education has influenced knowledge?” This question provides the guideline for testing subjects’ financial knowledge, as well as for inquiring into what is currently happening at WPI in terms of university action. This question also refers to alumni, who are graduated students.

4.2.2.1 Alumni Overall Performance on Financial Literacy Questions

To address alumni’s financial literacy, we investigated their comprehensive personal finance knowledge. As with the students surveys, the alumni survey included ten comprehensive questions on various financial literacy topics to measure student knowledge (see Appendix A). A correct answer was scored as a 1, and an incorrect answer or “I don’t know” response was scored as a 0, and the sum of these scores was taken. Alumni were encouraged to use the “I don’t know” option when faced with a question they were unsure on, so as to avoid skewing data with lucky guesses. The assessment was scored out of 10 points, meaning a score of 8 would equate to an 8/10 or 80%.

Of the 602 WPI alumni who completed the survey and received a score, the average score was a 7.37 out of 10, with a standard deviation of 1.677. The average score of 7.37 was significantly higher than 7.0 ($t = 5.723$, $p < .05$). Scores ranged from 0% correct to 100% correct.

It should be noted many alumni took issue with the wording of Q8 (see Appendix A). This question referred to a match retirement plan, but did not specify a type or ratio of match that the hypothetical company was offering. For this reason, 16 alumni emailed the team saying they could not answer the question with certainty, and responded “I don’t know”, which would normally be scored as a 0 on the question. This observation suggested alumni were demonstrating knowledge beyond the level of the question. As a result, alumni responding “I

don't know" were given a correct score for Q8. This distinction did not heavily alter results, as it only increased mean scoring by 0.1 points.

The use of "I don't know" also varied with alumni graduation year. Alumni who reported graduating two years ago or less in Question 3 utilized the "I don't know" response much less than alumni who graduated three or more years ago. Alumni who graduated two or less years ago were responsible for 20.412% of the "I don't know" responses, whereas those who graduated three or more years ago composed 43.59% of the responses. It is worthwhile to note that the rest of the "I don't know" responses, 36.328%, belonged to alumni who chose "Prefer not to say" for Q3, asking how long ago they graduated. Interestingly enough, this trend of graduating longer ago and selecting the "I don't know" option more is the opposite trend to that of students WPI, who tend to use "I don't know" less as they progress through school. As previously discussed in regards to Q8, this can likely be explained by alumni finding that questions did not include all information need to fully answer the question, which demonstrates a deeper level of understanding.

Using independent sample two-sided t-tests, scoring was also analyzed in regards to several demographic distinctions. The 357 males (7.5 mean score) performed slightly better than the 232 females (mean 7.21), with the difference in means being statistically significant ($t = 2.124, p < .05$). The difference in means between the 556 domestic student alumni (mean 7.49) and the 29 international student alumni (mean 6.45) was also statistically significant ($t = 3.643, p < .05$). Unlike for students, there is no difference in means between alumni who described their racial or ethnic heritage as white (508 alumni) than any other racial identification (94 alumni total) ($t = 1.835, p = .067$).

Using a paired sample independent t-test, the difference in mean scoring of 5.68 for students and 7.37 for alumni was statistically significant ($t = 25.937, p < .05$).

In summary, as with students, we found evidence that alumni overall performance is different within several major demographic groups. Alumni also certainly performed better than students. Within their own group, though, do alumni follow certain trends that students displayed?

4.2.2.3 Alumni Financial Literacy Based on Age & Experience

We investigated alumni ages and their connection to scoring on comprehensive financial literacy questions.

Students displayed that both being older and further along in one's college career was associated with statistically significant differences in mean scoring. Do alumni follow a similar trend? In Q22, alumni were asked to select what age range they fell into.

Using a one-way ANOVA test, the difference in means between the age groups was statistically significant ($f = 63.482, p < .05$). Furthermore, the mean scores by age group followed an upward trend, consistently increasing with the increase in age. Mean scores by age group are given in Table 6 below.

Table 6: Alumni Age Group Scoring

	18 or under	19-24	25-35	36-45	46 or over	Prefer not to say
N	36	100	354	88	18	6
Mean	3.69	7.29	7.63	7.81	8.06	7.33

In summary, for both students and alumni, findings assert that age (and the implied factor of life experience) is a contributing factor to one's level of financial literacy. While life experience seems to be a reason as to why people are financially literate, is work experience also a factor?

4.2.2.4 Financial Literacy of Those in Professional Finance Field of Work

We investigated if people who identify as working in a professional finance field are more financially literate than their counterparts. In an investigation of student coursework and financial literacy, we found no significant differences in scoring between those taking business related coursework (economics, finance, business management, etc.).

To investigate if those working in finance were more financially literate, we used a one-sided independent sample t-test, predicting that those in finance would be more financially literate. The results actually show a significant difference of means in favor of those not in finance. The mean score of the 562 alumni not selecting that they are in finance (mean 7.41) was greater than the mean score of those in finance (40 alumni, mean 6.80), with the difference being significant ($t = 2.353$, $p < .05$). Though, the power of this test is low due to the low sample size of finance professionals.

As with students, our results suggest that studying business and working in finance, while intuitively would seem factors making one more financially literate, do not lead to a greater level of financial literacy.

4.2.2.5 Conclusion

In answering the research question #1, "What is the current state of financial literacy at WPI from a student's knowledge standpoint, including how past education has influenced knowledge?", for alumni, we have interesting results. In comparison to students, alumni performed better on comprehensive financial literacy questions. Also, alumni performance steadily increased across age groups, as alumni ages grew. Surprisingly, we found that alumni in finance did not outperform their counterparts, although the test was from a small sample size and was therefore of very low power. We will seek to find similar information on research question #2 to that of the student investigation.

4.2.3 Research Question #2

Our second research question is, "How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do

they think would be the best ways for students to learn?”. This question now looks beyond performance and instead focuses on what students want to learn, why students want to learn, how they want to learn, and when. This question also applies to alumni. In terms of how alumni apply to this research question, those in the workforce and with more real life personal finance experience may have a better perspective on the most important aspects of personal finance to be literate in.

4.2.3.1 Topics That Matter to Alumni & Topics Alumni Wish they Understood Better

We investigated both what financial literacy topics mattered most to alumni (Q17), as well as what topics alumni wish they understood better (Q18).

WPI alumni have more experience handling larger quantities of money than students, and age has already been determined to be a contributing factor to financial literacy. Thus, the topics that matter to alumni are likely very important to know. Q17 asked alumni to rank what topics were most important to them. The most common first choice answer was Money Basics 101 (25.40%), followed by Investing Basics (18.74%). The most common last choice was Student Loan Repayment (23.93%) (many may have completed payments), followed by Buying Your First Car (21.03%). First choice and last choice frequency is reported in the table below:

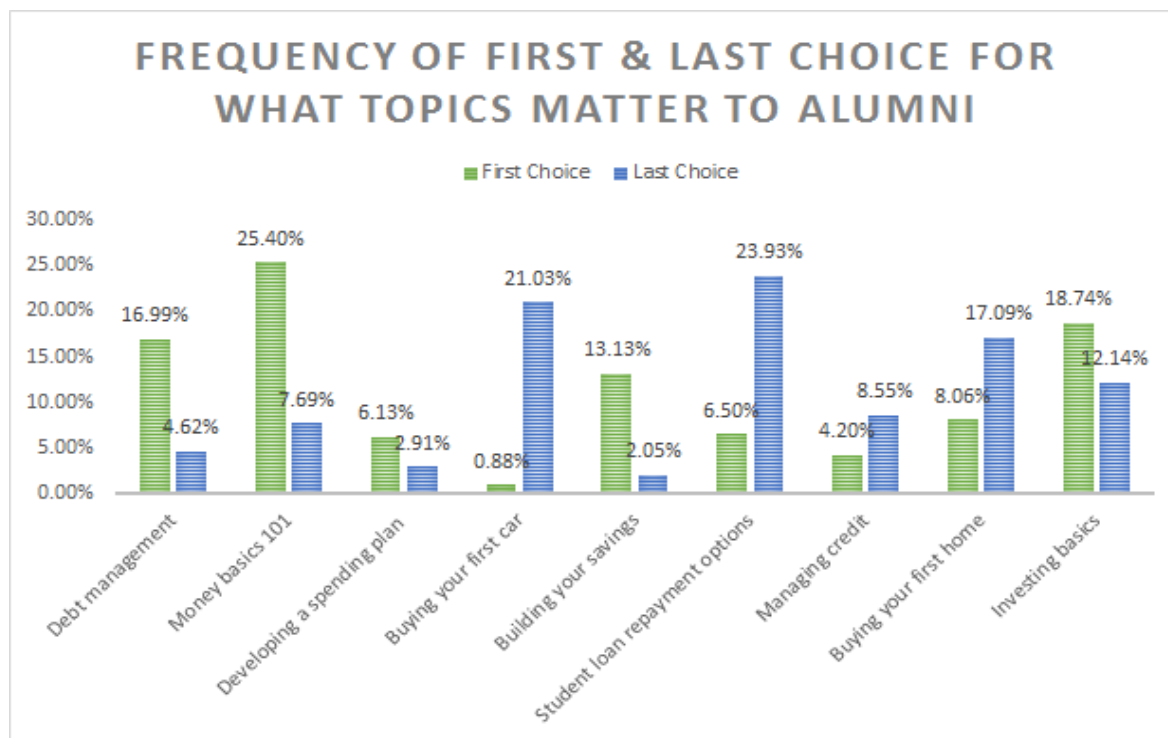


Figure 12: The frequency by which specific topics were chosen by alumni as either most or least important to them.

Q18 asked alumni to rank what topics they wish they understood better. Again, this information is valuable as it may provide insight into the specifics of what WPI graduates are missing when they leave school. The resounding most common first choice for what alumni wish they knew more about was Investing Basics (52.89%), followed by Buying Your First Home (11.73%) (a reflection of where alumni are at in life). The most common last choice (save for “other”) was Student Loan Repayment (23.84%). First and last choice frequency is reported in the table below:

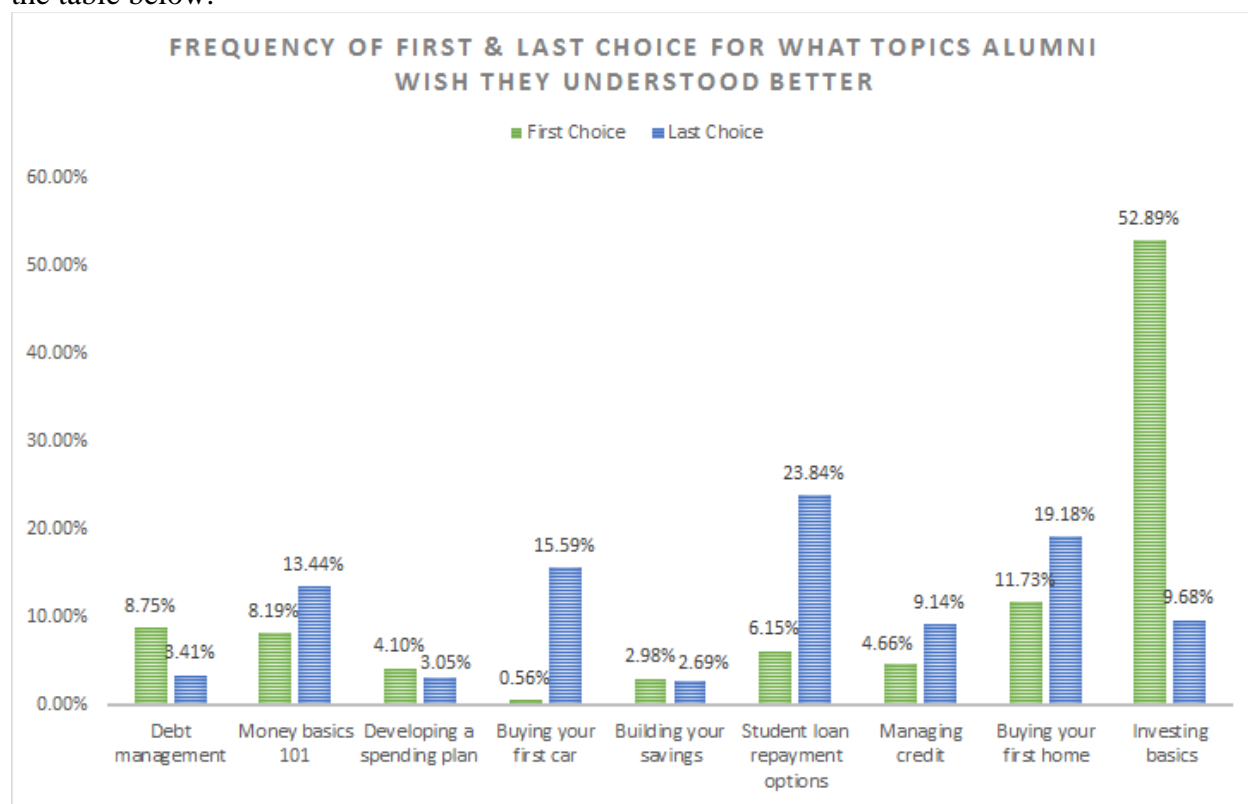


Figure 13: The frequency by which specific topics were chosen by alumni as either most or least wishful that they knew more about.

4.2.3.2 Alumni Perspective on a Financial Literacy Program

WPI’s financial literacy program is relatively young, dating back to 2011. Our survey was sent to graduates dating back to the class of 2000, meaning that many respondents may not have been able to utilize the resources. Furthermore, only 18 alumni have stated they attended a session or event. In other words, alumni generally did not receive the benefit of the financial literacy program.

That being said, a large number of alumni stated that financial literacy sessions in college would have been helpful. Q19 asked this question, and 85.22% percent of respondents (513 alumni) stated yes, they would have been helpful. Although this does not suggest that they feel

the program would be necessary or that they would attend, it does solidify the program's potential to be beneficial.

Furthermore, WPI alumni also feel that it is important for sessions to be offered. Q20 asks how important it is to be offering financial literacy sessions, ranked from 1-5 and 44.44% of alumni responded with a 5, or "Very Important". This was followed closely by 4, or "Important". The mean score for this Likert scale question was 4.24, meaning that alumni generally feel that offering sessions is important, with a partial skew towards being very important.

Overall, the alumni perspective on the financial literacy program at WPI is one that looks positively on the program.

4.2.3.2 Conclusion

In answering research question #2, "How can current WPI initiatives improve with what students want to learn from the financial literacy program, and what educational mediums do they think would be the best ways for students to learn?" we found interesting results. Overall, important financial topics for alumni were similar to preferences of students, including Debt Management and Money Basics 101 as selections. Dissimilar to students, alumni were uninterested in Student Loan Repayment education, as they likely are completed paying off their student loans or are well aware of the process. Finally, alumni felt that WPI offering financial literacy sessions was important, even more so than students did.

5.0 Conclusions and Recommendations



Figure 14: Students enjoying a financial literacy session

5.1 Conclusions

After analyzing our data and asserting findings, we have come to five major conclusions. In terms of our recommendations these conclusions have large implications. Our five major conclusions are as follows:

5.1.1 The Overall State of WPI Financial Literacy

Our first major conclusion is simply the status of where WPI students currently are in terms of financial literacy. Through our data analysis, we have found that financial literacy can be improved at WPI. The average score for the 1,110 student respondents was a 5.68/10. In comparison to past studies, this is a moderately promising score. Recall, in Avard's study, that Texas A&M students averaged a 34.8% score on comprehensive testing questions. In Mandell's study, only 10.3% of students were able to score a 70% or higher, whereas in our study 40.27% of students scored a 70% or higher. In general, WPI students outperformed students from past studies. With that being said, there is still room for improvement.

Certain demographic groups of WPI students were lacking in terms of financial literacy in comparison to their counterparts. Females performed worse than males. Underclassmen performed worse than upperclassmen. International students performed far worse than domestic students. Finally, white students outperformed students of other racial heritages. These differences in scoring may be a point of emphasis for OSA&FL to address. This will be further discussed in our recommendations.

602 responding alumni from WPI finished with an average score of 7.37, significantly higher than that of WPI students. Our survey was sent to 10,101 alumni from classes ranging from the Class of 2000 to the Class of 2016, meaning the large majority of recipients were not around for the financial literacy program at WPI. Furthermore, only 18 alumni reported attending a session, and 133 reported having taken a class in personal finance. Why the difference in scoring? We have found that experience matters in terms of one's level of financial literacy.

5.1.2 Optimal Financial Literacy Education has Experience-Based Components

Our second major conclusion is that financial literacy can be learned through practical experience. In both our student and alumni surveys, data show that as subjects grow in age, they become more financially literate. We attribute this growth to more life experience and more experience in handling money. Furthermore, we also found that students became more financially literate as they progressed through their college classes when observing scoring differences between underclassmen and upperclassmen/graduates.

While we did find that students who had taken a personal finance course performed better than those who did not, the study of our focus is on improving the financial literacy program offered by OSA&FL. To this point, we found that there was no difference in scoring between students who had attended a financial literacy session and those who had not. We also found no difference in scoring on an insurance question between students who attended a session based on insurance and those who had not. Thus, while we do conclude that formal education is effective, which sessions look to utilize in lecture style learning, we feel that the experience portion of financial literacy learning is what is lacking.

Overall, while we did find a formal course to have some effect on scoring, we believe the ability of life experience to increase financial literacy also has merit and should be implemented into the program as best as possible. This concept was discussed with WPI Senior VP, Kristin Tichenor:

“Human nature is such that it won't hit you until you experience it. Most of it is life experience: making mistakes and having money to spend. It is harder for students because you're spending somebody else's dime. And having to spend your own money makes you more aware of financial consequences. It takes time and experience. I learned more over time when I got my first job. Workshops are helpful as in the sense of a teaser to what is coming up next. However, it [financial literacy] is not something that can be completely taught through coursework” (November 18, 2016).

This assertion and how to implement such theory into sessions will be further discussed in our recommendations. As for why students attend sessions at all, perhaps a shift in marketing technique may be needed.

5.1.3 Students Are Not Prioritizing Financial Literacy

One conclusion we have come to realize is that students are not prioritizing financial literacy. When students were asked how important financial literacy was, the average score was 3.70 out of 5, meaning students on average tend to think sessions are important. That being said, alumni were asked the same question, and despite not being able to reap the benefits of said sessions, returned with an average score of 4.24. Alumni have far more experience managing their own money, and with this perspective comes an added validation to such an answer. Thus, even though students recognize that financial literacy education is important, they are not realizing how important. This is clearly indicated on Q5d, where answers such as “I feel that I do not require them” (25.7% of respondents cited this) or even “I always forget about them” (28.61%) were very common responses.

This lacking sense of urgency is an issue for several reasons. First off, there is a very weak correlation between the individual student’s self-rated score out of 10, introduced in Q7 and their comprehensive score out of 10. A weak correlation of this nature can be attributed to students who were overconfident in themselves and performed poorly, and vice versa. Both cases suggest a staggering difference between students perceived notion of what financial literacy is all about, and how knowledgeable they actually are. In essence, data suggest students actually do not know how financially literate they actually are. The combination of a lack of interest and a blind perception of how financially literate students are proves to be problematic.

It is believed that part of the reason students are blind to the true level of their financial literacy is because they are unaware of their lack of knowledge. In an interview with Rosemarie Alicea, the Assistant Director of OSA&FL, this issue was discussed:

“..as our executive director puts it ‘[students], they don’t know what they don’t know’, and, taking it one step further, unless it is affecting them at the present moment there is no urgency in learning about it. The recent workshop on Identity Theft was a clear example, with only 20 students attending the session. A new study came out saying that younger Americans between the ages of 18 to 34 lost more money in the last year from scams and ID theft. And that younger higher educated Americans are more susceptible to become a victim of scams, reason being ‘optimism bias’ to be the case.” (November 22, 2016)

Overall, we are concluding that students know financial literacy is important, but do not appreciate the magnitude of its importance. This issue will be discussed in our recommendations.

5.1.4 Session/Resource Planning

We investigated several important factors about what students are looking for in the financial literacy sessions, the biggest part of the financial literacy program. In particular, we looked at what types of events/resources students wanted most, when the best time to host sessions was, and what would incentivize students to attend, aside from knowledge and content.

In terms of what medium of education students want information to be presented in, workshops was the overwhelming first choice, with 43.68% of students selecting workshops as their first choice. This was followed by online content, at 24.81%. Workshops are currently the primary method, and should remain so. Although, changes can be made to the sessions.

One such change that could be taken into account is when to hold sessions. In Q20 and Q21, students are asked what day(s) of the week and time(s) of the day they are likely to attend sessions. The most selected day was Wednesdays. Both afternoon sessions and evening sessions were selected heavily. When cross tabulated, the most commonly selected time frame was Wednesday evening, followed by Wednesday afternoon. We conclude that Wednesdays are certainly the day to offer sessions, and we are indifferent as to whether the session is offered in the evening or afternoon.

Finally, in terms of what incentive is to be offered to encourage attendance, the most commonly chosen first selection was WPI apparel and items (63%), followed by food (22%). We conclude that offering at least the opportunity to win apparel will be well received by students.

5.1.5 Content of Financial Literacy Sessions

Finally, we investigated what the content of financial literacy topics should be. From a student perspective, students were very interested in Debt Management, Money Basics 101, and Student Loan Repayment options. Alumni were also very keen on Money Basics 101, as well as Investing Basics and Building Your Savings. Alumni were not interested in Student Loan Repayment. Overall, we conclude that students are interested most in the topics of Debt Management, Money Basics 101, Student Loan Repayment, Investing Basics, and Building Your Savings.

Sessions that were not perceived as important or interesting included Buying Your First Car and Buying Your First Home. We conclude that these sessions are not as important to students, and need not be their own independent sessions.

5.2 Recommendations

Our recommendations are based off of our major conclusions and findings, and intuitive ways to address issues related to these findings.

5.2.1 Overall Plan of Action

We recommend that the overall plan of action for the WPI financial literacy program should be conducive to achieving the goal of maximizing the level of financial literacy for all WPI students. Based off of this goal, there are two potential courses of action that we recommend. We recommend the plan outlined in 5.2.1.2 more than that in 5.2.1.1.

5.2.1.1 Need-Based Plan of Action (Not Preferred Choice)

One way to achieve the goal of improving financial literacy of all students is to target those who are most in need of financial literacy. This means marketing the program for and seeking out those who are the least financially literate on campus. Based on our findings,

international students and underclassmen are two examples of groups that are lacking, in particular in comparison to their counterparts.

Adjusting marketing efforts to specifically target groups of this nature and adjusting program content to match their specific needs would certainly increase WPI's overall financial literacy, as these groups are performing worse than the WPI average, are dragging scoring down.

That being said, the shortcomings of this plan is that it is not equitable, and does not have much potential for long term growth, as it is not beneficial to the entire student body. A plan inclusive of all students would be more beneficial in the long term, even if it would take longer to implement and results of compelling magnitude would come later.

5.2.1.2 Growth-Based Plan of Action (Preferred Choice)

A plan focusing on the growth of the WPI financial literacy program as a whole should be the focus of financial literacy leadership. This focus includes attainable goals of increasing the amount of resources available to OSA&FL, such as funding and labor hours, as well as potentially separating from OSA&FL, as described by Jennifer Sheehy, the Senior Assistant Director of OSA&FL,

“If I were to implement any changes to the current financial literacy program here on campus I would separate from the Office of Student Aid completely. Going to conferences, we see a lot of successful financial literacy programs that are separated from their financial aid offices. To have resources that are our own and not shared with the financial aid office and that would be our full time job and we could just run wild with it” (November 22, 2016).

An independent office with resources and people completely dedicated to financial literacy, rather than shared job descriptions with Student Aid responsibility, would be beneficial for the movement, growth, and outreach of the program. In order to reach such a plan, there are certain action items that can be taken to guide growth.

The first action item is to improve sessions/resources to be tailored to what students want and need. These changes to content including what information is presented, as well as how the information is presented, will be covered in depth in recommendation section 5.2.2.1. The second change is for a change in the marketing approach of OSA&FL, outlined in 5.2.2.2. Finally, the overarching course of action which is aided by the first two action items is to demonstrate both the need for and benefits of a successful financial literacy program. This includes bolstering the image of the program's effectiveness as well as necessity to students. An institution seeking to aid its students will take action in addressing needs, if a need of considerable magnitude is created/brought to the forefront.

An additional benefit of this growth-based plan is that if successful, the eventual growth may allow for programs that are inclusive to all students, as well as specialty outreach to the students who were addressed in the Need-Based Plan (5.2.1.1). While this would a long term goal, the potential alone makes the Growth-Based plan far more enticing, and we recommend this plan of action.

5.2.2 Short Term Recommendations to Implement to Make Overall Plan of Action Successful

There are several short-term, implementable recommendations we make for OSA&FL and the financial literacy program. These changes in particular encompass content changes (5.2.2.1) and changes to marketing (5.2.2.2).

5.2.2.1 Session Content Recommendations

The most immediate and pressing recommendation we make is to improve the quality of available sessions and resources. In particular, we recommend action in the areas of session topics, scheduling, and educational style.

In terms of session topics, our particular recommendations include utilizing Debt Management, Money Basics 101, Student Loan Repayment, investing basics, and building savings as the starting point for session topics, as students and alumni feel strongly about these topics. Of course, other content is necessary to include aside from the popular choices, such as Managing Credit. In terms of what to not include, we recommend replacing Buying Your First Car and Buying Your First Home with other session topics. Popular write-in topics that students were interested in include taxes and retirement, which we recommend as potential replacement sessions.

In terms of the style of content, we recommend continuing on with workshops as the primary educational outlet, but also supplementing these workshops with online content that is useful for both those who did attend and those who did not attend the workshops. In terms of what time during the week to offer sessions, a huge number of students cited Wednesday afternoons and evenings as preferential times to attend, so we recommend selecting one of these two time slots. If the resources are available, offering two sessions as opposed to one during a day would be recommended. Finally, we recommend including the opportunity to win WPI apparel as an incentive for students to attend sessions, supplemented by food.

One fundamental focus to all sessions we recommend is to make sessions as interactive and “real” as possible. We have found that financial literacy education is best consumed through experience, and sessions should look to create an environment that puts the student in a position where they can practice making decisions, and not just hear about the content. For example, students at a session on investing should not just be listening to a lecture, but also practicing investing in mock simulation style. Ideally, the interactive content would be online and made available at all times, so students could practice at sessions, as well as on their own time. The end goal should be for sessions to have cultivated some mock “life experience” in managing their money.

We recognize that a large part of the session experience is the guest speaker(s). Working with these guests to create interactive sessions is an added challenge, but might be far more beneficial to students in the long run, as they will be gaining hands-on experience.

Overall, we recommend several changes to what content and how content is presented. We will also look to recommend a change in marketing focus.

5.2.2.2 Marketing Content Recommendations

One final change we recommend is to shift marketing focus from advertising content and incentives to raising awareness about student lack of knowledge. We have found that students are not prioritizing financial literacy sessions, and in general are unaware of their lack of knowledge, and these are issues that need be addressed. Students who do not know they are lacking knowledge or students who do not think attaining this knowledge is necessary will not attend. Therefore, we recommend advertising sessions based around the pressing knowledge that if lacking could be detrimental to students. For example, in regards to Identity Theft, as discussed earlier by Rosemarie Alicea of OSA&FL, the marketing strategy would be to raise awareness to the fact that students and people ages 18-34 are most at risk of identity theft. Session details, location, and incentives should still be included in advertisements, but should not be the primary focus of marketing efforts.

We recommend continuing emails as the primary advertising outlet.

5.3 Impact of Recommendations

Overall, our recommendations, if implemented, have the potential to impact a vast array of people, both at WPI as well as in society in general. The overarching goal of our recommendations was to improve the level of financial literacy of WPI students. With our recommendations, this goal can be achieved. Though, increased financial literacy amongst students goes beyond just knowledge. As previously discussed, higher levels of financial literacy may also lead to greater financial prosperity. This increased financial prosperity may then have a snowball effect in the sense that local communities, the WPI community, as well as the economy in general stand to benefit. Money is an essential resource to any and all projects and/or movements, and both knowing how to manage one's finances as well as potentially having more funding as a result of financial literacy will only benefit these said projects/movements.

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Appendix

Appendix A: Surveys

Student Survey Questions:

Student Survey Personal Financial Intelligence IQP

Hello and thank you for taking the time to take this survey!

We are an on-campus IQP group working on a project concerning financial literacy of college students.

What is financial literacy?

“Financial Literacy is loosely defined as the ability to understand finance; more specifically, it refers to the set of skills and knowledge that allow an individual to make informed and effective decisions through their understanding of finance” (WPI Financial Aid Office, 2011)

This survey should take 10-15 minutes to complete and all responses will remain confidential and anonymous. Don't forget, at the end you will have the chance to win one in 10 pieces of WPI apparel/gear!

If you have any questions please don't hesitate to contact us at personalfinintel@wpi.edu.

Thank you!

Personal Financial Intelligence IQP Team

1. What best describes you?

- ☐ Freshman (1)
- ☐ Sophomore (2)
- ☐ Junior (3)
- ☐ Senior (4)
- ☐ Graduate (5)

2. Have you ever taken a personal finance course in high school or college?

- ☐ Yes (1)
- ☐ No (2)
- ☐ I don't know/remember. (3)

3. Are you currently funding your educational expenses with any federal, state, or private student loans?

- ☐ Yes (1)
- ☐ No (2)
- ☐ I'm not sure. (3)
- ☐ Prefer not to say. (4)

Answer If Are you currently funding your educational expenses with any federal, state, or private student loans... Yes Is Selected

3a. How much do you agree with the following statement?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I am currently aware of the amount of student debt I have accrued. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Are you aware that the OSA&FL offers financial literacy sessions?

- ☐ Yes (1)
- ☐ No (2)

Answer If [Are you aware that the OSA&FL offers financial literacy sessions?] Yes Is Selected

4a. How did you find out about the sessions? Please check all that apply.

- ☐ Email (1)
- ☐ Screen advertisement (screens in the Campus Center, Rec Center, etc) (2)
- ☐ Newsletters/Flyers (3)
- ☐ Table-sitting information (tables in Campus Center) (4)
- ☐ Online advertisement (WPI websites/social media) (5)
- ☐ Other (6) _____

Answer If [Have you attended a financial literacy session or other event offered by the OSA&FL?] No Is Selected

5d. Why have you not attended any sessions? Please check all that apply.

- ☐ I was not aware of the sessions. (1)
- ☐ I feel that I do not require them. (2)
- ☐ The topics do not interest me. (3)
- ☐ I could not make it to any of them. (4)
- ☐ I always forget about them. (6)
- ☐ Other (5) _____

6. What are your preferred means of finding out about events on campus? Please rank the following, with 1 being most preferred. (Drag to rank)

- _____ Email (1)
- _____ Screen advertisement (screens in the Campus Center, Rec Center, etc) (2)
- _____ Newsletters/flyers (3)
- _____ Table-sitting information (tables in Campus Center) (4)
- _____ Online advertisement (WPI website/social media) (5)
- _____ Other (6)

7. How would you personally rate your own financial literacy?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)
Rank from 1 to 10, with 10 being expert level. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following 10 questions will assess your financial literacy. Please choose the best answer for each question. It is perfectly ok to choose Option D "I don't know." Scores from this section will be presented to you at the end of the survey, but all anonymity and confidentiality will continue to be applied. To best help our study, please do not seek assistance on questions.

8. Savings accounts generally have _____ interest rates (than/to) checking accounts.

- ☐ higher (1)
- ☐ lower (2)
- ☐ equal (3)
- ☐ I don't know. (4)

9. Your company offers a 401k match retirement plan. You invest \$2,000 into this plan. What is the added dollar amount that your company adds to it?

- ☐ \$200 (1)
- ☐ \$1,000 (2)
- ☐ \$2,000 (3)
- ☐ I don't know. (4)

10. If your credit card is stolen and the thief runs up a total debt of \$1,000, but you notify the issuer of the card as soon as you discover that it is missing, what is the maximum amount that you can be forced to pay according to federal law?

- ☐ Nothing (1)
- ☐ \$50 (2)
- ☐ \$1,000 (3)
- ☐ I don't know. (4)

11. Scott and Eric are young men. Each has a good credit history. They work at the same company and make approximately the same salary. Scott has borrowed \$6,000 to take a vacation to a foreign country. Eric has also borrowed \$6,000 to buy a car. Who is likely to pay the lowest finance charge?

- ☐ Eric, because the car is collateral for the loan. (1)
- ☐ Scott, because travelers are eligible for discounts. (2)
- ☐ They will both pay the same amount because they have almost identical financial backgrounds. (3)
- ☐ I don't know. (4)

12. Why is it important to limit monthly spending to an amount less than one's take home pay?

- ☐ In case there is a special shopping promotion. (1)
- ☐ Banks will lower your interest rate is less than 10% of your paycheck is deposited. (2)
- ☐ It is important to maintain a buffer of funds for emergency situations (medical, disaster, loss of job, etc). (3)
- ☐ I don't know. (4)

13. Rob and Mary are the same age. At age 25 Mary began saving \$2,000 a year while Rob saved nothing. At age 50, Rob realized he needed money for retirement and began to save \$4,000 a year, while Mary kept saving her \$2,000. Now they are both 75 years old. Assuming they both have the same interest rate, who has the most money in his or her retirement account?

- ☐ They would each have the same amount because they put away exactly the same amount. (1)
- ☐ Rob, because he saved more each year. (2)
- ☐ Mary, because her money has grown for a longer time at compound interest. (3)
- ☐ I don't know. (4)

14. When you first begin repaying you federal student loan, you can change repayment plans at any time for free.

- ☐ True (1)
- ☐ False (2)
- ☐ I don't know. (3)

15. What is the main difference between an unsubsidized loan and a subsidized loan?

- ☐ Unsubsidized loans the student must pay the interest for all periods; subsidized loans the student does not have to pay interest until after a grace period. (1)
- ☐ Unsubsidized loans are paid for by the government; subsidized loans are paid for by private loan agencies. (2)
- ☐ Unsubsidized loans the student does not have to pay interest until after a grace period; subsidized loans the student must pay interest for all periods. (3)
- ☐ I don't know. (4)

16. Your take-home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay?

- ☐ Federal income tax, property tax, and Medicare and social security contributions. (1)
- ☐ Federal income tax, Medicare, and social security contributions. (2)
- ☐ Federal income tax, sales tax, and social security contributions. (3)
- ☐ I don't know. (4)

17. If each of the following people have the same amount of take home pay, who needs the greatest amount of life insurance?

- ☐ An elderly retired man, with a wife who is also retired. (1)
- ☐ A young single woman with two young children. (2)
- ☐ A young single woman without any children. (3)
- ☐ I don't know. (4)

18. What financial literacy topics matter most to you? Please rank the following, with 1 being the most important to you. (Drag to rank)

- _____ Debt management (1)
- _____ Money Basics 101 (2)
- _____ Developing a spending plan (3)
- _____ Buying your first car (4)
- _____ Building your savings (5)
- _____ Student loan repayment options (6)
- _____ Managing credit (7)
- _____ Buying your first home (8)
- _____ Investing basics (9)
- _____ Other: (10)

19. Which financial literacy topics do you wish you understood better? Please rank the following, with 1 being the most important to you. (Drag to rank)

- _____ Debt management (1)
- _____ Money Basics 101 (2)
- _____ Developing a spending plan (3)
- _____ Buying your first car (4)
- _____ Building your savings (5)
- _____ Student loan repayment options (6)
- _____ Managing credit (7)
- _____ Buying your first home (8)
- _____ Investing basics (9)
- _____ Other: (10)

20. If financial literacy sessions were offered on campus, which days of the week would you be most likely to attend? Please check all that apply.

- ☐ Monday (1)
- ☐ Tuesday (2)
- ☐ Wednesday (3)
- ☐ Thursday (4)
- ☐ Friday (5)
- ☐ Saturday (6)
- ☐ Sunday (7)

21. If financial literacy sessions were offered on campus, what time of day would you be most likely to attend? Please check all that apply.

- ☐ Morning (9am-noon) (1)
- ☐ Afternoon (noon-5pm) (2)
- ☐ Evening (5pm-8pm) (3)

22. What is the maximum time you would want a typical financial literacy session to last?

- ☐ 30 minutes (1)
- ☐ 1 hour (2)
- ☐ 1.5 hours (3)
- ☐ 2+ hours (4)

23. What type of educational event/source are you most likely to attend/utilize? Please rank the following, with 1 being most likely to attend/utilize. (Drag to rank)

- _____ Workshops (1)
- _____ Guest Speakers (2)
- _____ Online content (self-taught) (3)
- _____ One on one sessions (4)
- _____ Large fairs (covers all aspects in one event) News (5)
- _____ Newsletters (6)
- _____ Other (7)

24. If you had to choose someone, who would be your ideal "coach" for one-on-one coaching sessions? Please rank the following, with 1 being most ideal. (Drag to rank)

- _____ Peer (student) (1)
- _____ Expert in the OSA&FL (2)
- _____ Professional volunteer (3)
- _____ Other: (4)

25. Which of the following would best incentive for you to attend? Please rank the following, with 1 being the best. (Drag to rank)

- _____ Food (ex. pizza) (1)
- _____ WPI apparel/items (2)
- _____ Raffles for higher value prizes (ex. TV's) (3)
- _____ Other: (4)

26. How important is it for WPI to be offering financial literacy sessions?

	Not important	Slightly	Moderately	Very	Extremely
	(1)	important (2)	important (3)	important (4)	important (5)
Please choose (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. To which gender do you most identify with?

- ☐ Male (1)
- ☐ Female (2)
- ☐ Other (3)
- ☐ Prefer not to say. (4)

28. What is your age?

- ☐ 18 or under (1)
- ☐ 19-24 (2)
- ☐ 25-35 (3)
- ☐ 36-45 (4)
- ☐ 46 or over (5)
- ☐ Prefer not to say. (6)

29. What is your major? Please include your major, and any additional majors or minors.

This question utilized two drop down menus, one for primary major, and another for any additional minors/majors.

Provided Options:

Actuarial Math

Aerospace Engineering

Applied Physics

Architectural Engineering

Biochemistry

Bioinformatics & Computational Bio
 Biology & Biotechnology
 Biomedical Engineering
 Business/Management
 Chemical Engineering
 Chemistry
 Civil Engineering
 Computer Science
 Economic Science
 Electrical & Computer Engineering
 Environmental Studies
 Environmental Engineering
 Humanities & Arts
 Industrial Engineering
 IMGD
 International & Global Studies
 Liberal Arts & Engineering
 Management Engineering
 Management Sciences & Information Systems
 Math
 Mechanical Engineering
 Physics
 Psychological Science
 Robotics Engineering
 Society, Technology, Policy
 Writing
 Other
 Prefer not to say

30. Which of the following best describes your racial or ethnic heritage?

- ☐ White (1)
- ☐ Hispanic or Latino (2)
- ☐ Black or African American (3)
- ☐ Native American or American Indian (4)
- ☐ Asian/Pacific Islander (5)
- ☐ Other (6)
- ☐ Prefer not to say. (7)

31. Are you a domestic or international student?

- ☐ Domestic (1)
- ☐ International (2)
- ☐ Prefer not to say. (3)

Alumni Survey Questions:

Alumni Survey Personal Financial Intelligence IQP

Hello and thank you for taking the time to take this survey!

We are an on-campus IQP group working on a project concerning financial literacy of college students.

What is financial literacy?

Financial Literacy is loosely defined as the ability to understand finance; more specifically, it refers to the set of skills and knowledge that allow an individual to make informed and effective decisions through their understanding of finance” (WPI Financial Aid Office, 2011)

This survey should take 10-15 minutes to complete and all responses will remain confidential and anonymous.

If you have any questions please don't hesitate to contact us at personalfinintel@wpi.edu.

Thank you

Personal Financial Intelligence IQP Team

1 What best describes you? Please check all that apply.

- ☐ Alumnus (1)
- ☐ Professional working in finance related field (2)

2 Have you ever taken a personal finance course in high school or college?

- ☐ Yes (1)
- ☐ No (2)
- ☐ I don't know/remember. (4)

3 How long ago did you graduate?

- ☐ 2 or less years (1)
- ☐ 3 or more years (2)
- ☐ Prefer not to say. (3)

Answer If How long ago did you graduate? 2 or less years Is Selected

4 Are you aware that the OSA&FL offers financial literacy sessions?

- ☐ Yes (1)
- ☐ No (2)

Answer If [Are you aware that the OSA&FL offers financial literacy sessions?] Yes Is Selected

4a How did you find out about the sessions? Please check all that apply.

- ☐ Email (1)
- ☐ Screen advertisement (screens in the Campus Center, Rec Center, etc) (2)
- ☐ Flyers (3)
- ☐ Table-sitting information (tables in Campus Center) (4)
- ☐ Online advertisement (WPI websites/social media) (5)
- ☐ Other (6) _____

Answer If [Are you aware that the OSA&FL offers financial literacy sessions?] Yes Is Selected

5 Have you ever attended a financial literacy session or other event offered by the OSA&FL?

- ☐ Yes (1)
- ☐ No (2)

Answer If [Have you ever attended a financial literacy session or other event offered by the OSA&FL?] Yes Is Selected

5a How many did you attend?

- ☐ 1-2 (1)
- ☐ 3-4 (2)
- ☐ 5+ (3)

Answer If [Have you ever attended a financial literacy session or other event offered by the OSA&FL?] Yes Is Selected

5b What was the topic of the session(s)/event(s)? Please check all that apply.

- ☐ Credit (1)
- ☐ Budgeting (2)
- ☐ Loans (3)
- ☐ Investing (4)
- ☐ Insurance (5)
- ☐ General finance after college (6)
- ☐ I don't remember (7)

Answer If [Have you ever attended a financial literacy session or other event offered by the OSA&FL?] Yes Is Selected

5c Generally how did you feel about the sessions? (Context, style and overall satisfaction)

	Extremely dissatisfied (1)	dissatisfied (2)	Neutral (3)	Satisfied (4)	Extremely satisfied (5)
Please Rate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Answer If [Have you ever attended a financial literacy session or other event offered by the OSA&FL?] No Is Selected

5d Why did you not attend any sessions? Please check all that apply.

- ☐ I was not aware of the sessions. (1)
- ☐ I felt that I did not require them. (2)
- ☐ The topics did not interest me. (3)
- ☐ I could never make it to any of them. (4)
- ☐ I always forgot about them. (5)
- ☐ Other (6) _____

6 How would you personally rate your own financial literacy?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)
Please rate from 1 to 10, with 10 being expert level. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following 10 questions will assess your financial literacy. Please choose the best answer for each question. It is perfectly ok to choose Option D "I don't know." Scores from this section will be presented to you at the end of the survey, but all anonymity and confidentiality will continue to be applied. To best help our study, please do not seek assistance on questions.

7 Savings accounts generally have _____ interest rates (than/to) checking accounts.

- ☐ higher (1)
- ☐ lower (2)
- ☐ equal (3)
- ☐ I don't know. (4)

8 Your company offers a 401k match retirement plan. You invest \$2,000 into this plan. What is the added dollar amount that your company adds to it?

- ☐ \$200 (1)
- ☐ \$1,000 (2)
- ☐ \$2,000 (3)
- ☐ I don't know. (4)

9 If your credit card is stolen and the thief runs up a total debt of \$1,000, but you notify the issuer of the card as soon as you discover that it is missing, what is the maximum amount that you can be forced to pay according to federal law?

- ☐ Nothing (1)
- ☐ \$50 (2)
- ☐ \$1,000 (3)
- ☐ I don't know. (4)

10 Scott and Eric are young men. Each has a good credit history. They work at the same company and make approximately the same salary. Scott has borrowed \$6,000 to take a vacation to a foreign country. Eric has also borrowed \$6,000 to buy a car. Who is likely to pay the lowest finance charge?

- ☐ Eric, because the car is collateral for the loan. (1)
- ☐ Scott, because travelers are eligible for discounts. (2)
- ☐ They will both pay the same amount because they have almost identical financial backgrounds. (3)
- ☐ I don't know. (4)

11 Why is it important to limit monthly spending to an amount less than one's take home pay?

- ☐ In case there is a special shopping promotion. (1)
- ☐ Banks will lower your interest rate if less than 10% of your paycheck is deposited. (2)
- ☐ It is important to maintain a buffer of funds for emergency situations (medical, disaster, loss of job, etc). (3)
- ☐ I don't know. (4)

12 Rob and Mary are the same age. At age 25 Mary began saving \$2,000 a year while Rob saved nothing. At age 50, Rob realized he needed money for retirement and began to save \$4,000 a year, while Mary kept saving her \$2,000. Now they are both 75 years old. Assuming they both have the same interest rate, who has the most money in his or her retirement account?

- ☐ They would each have the same amount because they put away exactly the same amount. (1)
- ☐ Rob, because he saved more each year. (2)
- ☐ Mary, because her money has grown for a longer time at compound interest. (3)
- ☐ I don't know. (4)

13 When you first begin repaying your federal student loan(s), you can change repayment plans at any time for free.

- ☐ True (1)
- ☐ False (2)
- ☐ I don't know. (3)

- 14 What is the main difference between an unsubsidized loan and a subsidized loan?
- ☐ Unsubsidized loans the student must pay the interest for all periods; subsidized loans the student does not have to pay interest until after a grace period. (1)
 - ☐ Unsubsidized loans are paid for by the government; subsidized loans are paid for by private loan agencies. (2)
 - ☐ Unsubsidized loans the student does not have to pay interest until after a grace period; subsidized loans the student must pay interest for all periods. (3)
 - ☐ I don't know. (4)

- 15 Your take-home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay?
- ☐ Federal income tax, property tax, and Medicare and social security contributions. (1)
 - ☐ Federal income tax, Medicare, and social security contributions. (2)
 - ☐ Federal income tax, sales tax, and social security contributions. (3)
 - ☐ I don't know. (4)

- 16 If each of the following people have the same amount of take home pay, who needs the greatest amount of life insurance?
- ☐ An elderly retired man, with a wife who is also retired. (1)
 - ☐ A young single woman with two young children. (2)
 - ☐ A young single woman without any children. (3)
 - ☐ I don't know. (4)

- 17 What financial literacy topics matter most to you? Please rank the following, with 1 being the most important to you. (Drag to rank)
- _____ Debt management (1)
 - _____ Money Basics 101 (2)
 - _____ Developing a spending plan (3)
 - _____ Buying your first car (4)
 - _____ Building your savings (5)
 - _____ Student loan repayment options (6)
 - _____ Managing credit (7)
 - _____ Buying your first home (8)
 - _____ Investing basics (9)
 - _____ Other: (10)

18 Which topics of financial literacy do you wish you understood better? Please rank the following, with 1 being the most important to you. (Drag to rank)

- _____ Debt management (1)
- _____ Money Basics 101 (2)
- _____ Developing a spending plan (3)
- _____ Buying your first car (4)
- _____ Building your savings (5)
- _____ Student loan repayment options (6)
- _____ Managing credit (7)
- _____ Buying your first home (8)
- _____ Investing Basics (9)
- _____ Other: (10)

19 Do you think financial literacy sessions in college would have been helpful?

- ☐ Yes (1)
- ☐ No (2)
- ☐ I don't know. (3)

Answer If Do you think financial literacy sessions in college would have been helpful? Yes Is Selected

20 How important is it for WPI to be offering financial literacy sessions?

	Not important (1)	Slightly Important (2)	Somewhat Important (3)	Important (4)	Very important (5)
Please choose (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21 To which gender do you most identify with?

- ☐ Male (1)
- ☐ Female (2)
- ☐ Other (3)
- ☐ Prefer not to say. (4)

22 What is your age?

- ☐ 18 or under (1)
- ☐ 19-24 (2)
- ☐ 25-35 (3)
- ☐ 36-45 (4)
- ☐ 46 or over (5)
- ☐ Prefer not to say. (6)

23 What was your major? Please include your major, and any additional majors or minors.

This question utilized two drop down menus, one for primary major, and another for any additional minors/majors.

Provided Options:

Actuarial Math
Aerospace Engineering
Applied Physics
Architectural Engineering
Biochemistry
Bioinformatics & Computational Bio
Biology & Biotechnology
Biomedical Engineering
Business/Management
Chemical Engineering
Chemistry
Civil Engineering
Computer Science

Economic Science
Electrical & Computer Engineering
Environmental Studies
Environmental Engineering
Humanities & Arts
Industrial Engineering
IMGD
International & Global Studies
Liberal Arts & Engineering
Management Engineering
Management Sciences & Information Systems
Math
Mechanical Engineering
Physics
Psychological Science
Robotics Engineering
Society, Technology, Policy
Writing
Other
Prefer not to say

24 Which of the following best describes your racial or ethnic heritage?

- ☐ White (1)
- ☐ Hispanic or Latino (2)
- ☐ Black or African American (3)
- ☐ Native American or American Indian (4)
- ☐ Asian/Pacific Islander (5)
- ☐ Other (6)
- ☐ Prefer not to say. (7)

25 Were you a domestic or international student?

- ☐ Domestic (1)
- ☐ International (2)
- ☐ Prefer not to say. (3)

Conclusion Questions

At the conclusion of surveying we will be conducting interviews for our follow-up process (i.e. further investigation, preliminary findings testing). Would you be willing to participate in the interview process? If so, provide email here: _____

Thank you for participating and results can be shared with you at your desire, provided your email here: _____

Appendix B: Interviews

Professional Interview Questions:

1. How would you rate your level of financial literacy?
2. How did you learn about finance/financial practices?
 - a. When you were entering the workforce, how financially literate were you?
 - b. How do you think students today are learning about finance/financial practices? (perhaps explain your own personal ways of learning thus far)
3. In our preliminary research, we have found that a low level of financial literacy tends to coincide with weaker financial decision making. What are your thoughts on this notion?
4. Do you think college students have a good handle on personal finance?
5. How would you compare college students' personal financial literacy to that of the average working adult?
6. How would you compare WPI student's personal financial literacy to that of college students at other universities?
7. What are your thoughts on the following statement? *Financial literacy leads to greater financial decision making and in turn greater financial prosperity in the long term.*
8. Do you believe WPI students could be impacted if they have limited knowledge on financial literacy and money management skills when they enter the workforce?
9. Do you feel WPI has a responsibility to ensure that its students are graduating with a certain level of financial literacy/money management skills so that they are prepared to make wise financial decisions once they leave WPI? Why or why not?
 - a. If no, whose responsibility is it?
10. Do you believe there is potential for long term benefits to WPI as an institution if its students are financially literate? (For example, higher earnings, wealthier & potentially more successful alumni, greater allowance for alumni donation, etc.)
11. In our project, we will collect survey data on the financial knowledge of WPI undergraduate students. Past national surveys that we have reviewed have returned very poor results amongst college age students, perhaps suggesting the need for improvement

in how students learn. What information in particular would be most needed to determine whether more needs to be done?

12. WPI is currently offering financial literacy initiatives, including seminars, fairs, and workshops. From what you know about these events, do you think WPI is doing enough for its students?
 - a. Do you believe the programs in place are effective?
 - b. What improvements or changes would you suggest?
 - c. In a perfect world with no limit on resources, what would the ideal financial literacy education at WPI look like?
13. Yale offers one-on-one sessions to their graduate students for financial literacy coaching. We think this would be a great initiative to offer to WPI undergraduate and graduate students. What is your opinion on one-on-one coaching? Do you know of any other colleges that have one on one coaching?

Alumni Interview Questions:

1. How would you rate your level of financial literacy?
2. How did you learn about finance/financial practices?
 - a. When you were entering the workforce, how financially literate were you?
 - b. How do you think students today are learning about finance/financial practices? (perhaps explain your own personal ways of learning thus far)
3. In our preliminary research, we have found that a low level of financial literacy tends to coincide with weaker financial decision making. What are your thoughts on this notion?
4. Do you think college students have a good handle on personal finance?
5. How would you compare college students' personal financial literacy to that of the average working adult?
6. If you could turn back time and tell your college-self one thing related to financial literacy that would have benefitted you, what would that be and why?
7. How would you compare WPI student's personal financial literacy to that of college students at other universities?

8. What are your thoughts on the following statement? Financial literacy leads to greater financial decision making and in turn greater financial prosperity in the long term.
9. Do you believe WPI students could be impacted if they have limited knowledge on financial literacy and money management skills when they enter the workforce?
What do you think is the most important topic of financial literacy students need to know before they go out into the working world?
10. What financial literacy topics do you wish the financial aid office offered when you were a student?
11. Do you feel WPI has a responsibility to ensure that its students are graduating with a certain level of financial literacy/money management skills so that they are prepared to make wise financial decisions once they leave WPI? Why or why not?
12. Do you believe there is potential for long term benefits to WPI as an institution if its students are financially literate? (For example, higher earnings, wealthier & potentially more successful alumni, greater allowance for alumni donation, etc.)
13. In our project, we will collect survey data on the financial knowledge of WPI undergraduate students. Past national surveys that we have reviewed have returned very poor results amongst college age students, perhaps suggesting the need for improvement in how students learn. What information in particular would be most needed to determine whether more needs to be done?
14. WPI is currently offering financial literacy initiatives, including seminars, fairs, and workshops. From what you know about these events, do you think WPI is doing enough for its students?
 - a. Do you believe the programs in place are effective?
 - b. What improvements or changes would you suggest?
 - c. In a perfect world with no limit on resources, what would the ideal financial literacy education at WPI look like?
 - d. What are some of the reasons why WPI wouldn't/couldn't make its financial literacy education programs more robust?
15. Yale offers one-on-one sessions to their graduate students for financial literacy coaching. We think this would be a great initiative to offer to WPI undergraduate and graduate students. What is your opinion on one-on-one coaching? Do you know of any other colleges that have one on one coaching?

Do you have any additional comments?

Student Interview Questions:

1. Undergraduate or graduate student?
2. Do you live on or off campus?
3. How important do you think financial literacy education is? Scale from 1-5, 5 being very important. Why?
4. How well do you think you did on the survey?
5. One of the questions on the survey asked you to rate your own financial literacy knowledge. After taking the survey, do you think your rating would change?
6. How do you find out about financial literacy sessions?
7. Have you ever gone to a financial literacy session?
8. What type of incentive would interest you the most to attend a financial literacy session?
9. What type of financial literacy event/source would you be most inclined to attend/use?
10. If you were told you could implement any changes and/or new programs on campus involving financial literacy education, what would you implement and why?
11. What are your thoughts on one-on-one coaching sessions at WPI?
12. What financial literacy subject do you wish you knew more about? Why?
13. What subject on financial literacy do you think is important to know about? Why?

Do you have any additional comments?

Video Segment:

1. Pop-culture questions (3 questions)
 - a. Can you name a Taylor Swift BF?
 - b. Who won the SuperBowl this past year?
 - c. Who sings the songs “Baby” and “Love Yourself”?

2. Financial Literacy questions (3 questions)
 - a. What is the difference between a credit card and a debit card?
("Credit Card vs. Debit Card," 2012)
 - b. What is considered an excellent credit score?
("Financial literacy quiz," 2016)
 - c. If your credit card is stolen and the thief runs up a total debt of \$1,000, but you notify the issuer of the card as soon as you discover it is missing, what is the maximum amount that you must pay according to Federal law? (Mandell, 2008)
3. Why is financial literacy important?

Appendix C: Consent Forms

Video Consent Agreement

WPI Personal Financial Intelligence IQP Interview & Video Consent Agreement

Interview Agreement

Introduction: You are being asked to participate in a research study. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomforts that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Purpose of the study: The purpose of our study is to compile & analyze data on the financial intelligence of WPI students & alumni, as well as their preferred methods of education in terms of learning to be financially literate.

Procedures to be followed: Subject will be asked several questions based upon the group's desired needs in terms of data collection. Questions will be based on demographics, financial intelligence, and preferred learning methods. Student interviews will be no longer than 10 minutes and alumni and professional interviews will be no longer than one hour. Answers will be analyzed in order to contribute to study findings. Confidentiality will be maintained.

Benefits/Risks: There will be no tangible benefits to the subject. Risks to the subject are minimal, as the subject will not be required to participate in any part of the study if they do not wish to, mainly in regards to not having to answer any question the subject does not wish to answer. Subjects may also be quoted in the study, though, confidentiality will be maintained.

Agreement: By signing below, the subject acknowledges that they understand the purpose of the study, procedures to be followed, and perceived benefits/risks; the subject is agreeing to participate in the interview, including the allowance of answers to be analyzed and potentially quoted to contribute to the study. Confidentiality will be maintained.

Signature of Subject

Date

Printed Name of Subject

Video Recording Agreement

Purpose: Video Recording will be utilized to assist in data collection and analysis from interviews, as well as potential to be included in an educational video about Financial Literacy to be published by the Office of Student Aid & Financial Literacy.

Disclaimer: Subjects need not be recorded to be interviewed. Subjects can decline video recording and still be interviewed with sound recording. Subject can also decline any type of electronic recording.

Check those that apply: ☐ I agree to be sound taped for data collection & analysis.

☐ I agree to be videotaped for data collection & analysis.

☐ I agree to be videotaped for potential appearance in educational video.

Signature of Subject

Date

Printed Name of Subject

Appendix D: Data Legends

Student Data Legend

Questions	Research Question	Topic Measured	Variable Coding
1 What best describes you?	1, 2	Demographics	1: Freshman; 2: Sophomore; 3: Junior; 4: Senior; 5: Graduate
2 Have you ever taken a personal finance course in high school or college?	1, 2	Background	1: Yes; 2: No; 3: I don't know/remember
3 Are you currently funding your educational expenses with any federal, state, or private student loans?	1, 2	Background	Yes (1) No (2) I'm not sure. (3) Prefer not to say. (4)
3a How much do you agree with the following statement? I am currently aware of the amount of student debt I have accrued.	1, 2	Background	1-7 Leichardt
4 Are you aware that the OSA&FL offers financial literacy sessions?	1, 2	Background	Yes (1) No (2)
4a How did you find out about the sessions? Please check all that apply.	1, 2	Background	Email (1) Screen advertisement (screens in the Campus Center, Rec Center, etc) (2) Newsletters/Flyers (3) Table-sitting information (tables in Campus Center) (4) Online advertisement (WPI websites/social media) (5) Other (6)
5 Have you attended a financial literacy session or other event offered by the OSA&FL?	1, 2	Background	Yes (1) No (2)
5a How many have you attended?	1, 2	Background	1-2 (1) 3-4 (2) 5+ (3)
5b What was the topic of the session(s)/event(s)? Please check all that apply.	1, 2	Background	Credit (1) Budgeting (2) Loans (3) Investing (4) Insurance (5) General finance after college (6) I don't remember (7)

5c Generally, how did you feel about the sessions?	1, 2	Background	1-7 Leichardt
5d Why have you not attended any sessions? Please check all that apply.	1, 2	Background	I was not aware of the sessions. (1) I feel that I do not require them. (2) The topics do not interest me. (3) I could not make it to any of them. (4) I always forget about them. (6) Other (5)
6 What are your preferred means of finding out about events on campus? Please rank the following, with 1 being most preferred		Method of Education	Email (1) Screen advertisement (screens in the Campus Center, Rec Center, etc) (2) Newsletters/flyers (3) Table-sitting information (tables in Campus Center) (4) Online advertisement (WPI website/social media) (5) Other (6)
7 How would you personally rate your own financial literacy?	1	Knowledge	1-10 Leichardt
8 Savings accounts generally have _____ interest rates (than/to) checking accounts.	1	Knowledge	higher (1) lower (2) equal (3) I don't know. (4)
9 Your company offers a 401k match retirement plan. You invest \$2,000 into this plan. What is the added dollar amount that your company adds to it?	1	Knowledge	\$200 (1) \$1,000 (2) \$2,000 (3) I don't know. (4)
10 If your credit card is stolen and the thief runs up a total debt of \$1,000, but you notify the issuer of the card as soon as you discover that it is missing, what is the maximum amount that you can be forced to pay according to federal law?	1	Knowledge	Nothing (1) \$50 (2) \$1,000 (3) I don't know. (4)
11 Scott and Eric are young men. Each has a good credit history. They work at the same company and make approximately the same salary. Scott has borrowed \$6,000 to take a vacation to a foreign country. Eric has also borrowed \$6,000 to buy a car. Who is likely to pay the lowest finance charge?	1	Knowledge	Eric, because the car is collateral for the loan. (1) Scott, because travelers are eligible for discounts. (2) They will both pay the same amount because they have almost identical financial backgrounds. (3) I don't know. (4)
12 Why is it important to limit monthly spending to an amount less than one's take home pay?	1	Knowledge	In case there is a special shopping promotion. (1) Banks will lower your interest rate is less than 10% of your paycheck is deposited. (2) It is important to maintain a buffer of funds for emergency situations (medical, disaster, loss of job, etc). (3) I don't know. (4)
13 Rob and Mary are the same age. At age 25 Mary began saving \$2,000 a year while Rob saved nothing. At age 50, Rob realized he needed money	1	Knowledge	They would each have the same amount because they put away exactly the same amount. (1) Rob, because he saved more each year. (2)

for retirement and began to save \$4,000 a year, while Mary kept saving her \$2,000. Now they are both 75 years old. Assuming they both have the same interest rate, who has the most money in his or her retirement account?			Mary, because her money has grown for a longer time at compound interest. (3) I don't know. (4)
14 When you first begin repaying you federal student loan, you can change repayment plans at any time for free.	1	Knowledge	True (1) False (2) I don't know. (3)
15 What is the main difference between an unsubsidized loan and a subsidized loan?	1	Knowledge	Unsubsidized loans the student must pay the interest for all periods; subsidized loans the student does not have to pay interest until after a grace period. (1) Unsubsidized loans are paid for by the government; subsidized loans are paid for by private loan agencies. (2) Unsubsidized loans the student does not have to pay interest until after a grace period; subsidized loans the student must pay interest for all periods. (3) I don't know. (4)
16 Your take-home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay?	1	Knowledge	Federal income tax, property tax, and Medicare and social security contributions. (1) Federal income tax, Medicare, and social security contributions. (2) Federal income tax, sales tax, and social security contributions. (3) I don't know. (4)
17 If each of the following people have the same amount of take home pay, who needs the greatest amount of life insurance?	1	Knowledge	An elderly retired man, with a wife who is also retired. (1) A young single woman with two young children. (2) A young single woman without any children. (3) I don't know. (4)
18 What financial literacy topics matter most to you? Please rank the following, with 1 being the most important to you.	2	Method of Education	Debt management (1) Money Basics 101 (2) Developing a spending plan (3) Buying your first car (4) Building your savings (5) Student loan repayment options (6) Managing credit (7) Buying your first home (8) Investing basics (9) Other: (10)
19 Which financial literacy topics do you wish you understood better? Please rank the following, with 1 being the most important to you.	2	Method of Education	Debt management (1) Money Basics 101 (2) Developing a spending plan (3) Buying your first car (4) Building your savings (5) Student loan repayment options (6) Managing credit (7) Buying your first home (8) Investing basics (9)

			Other: (10)
20 If financial literacy sessions were offered on campus, which days of the week would you be most likely to attend? Please check all that apply.	2	Method of Education	Monday (1) Tuesday (2) Wednesday (3) Thursday (4) Friday (5) Saturday (6) Sunday (7)
21 If financial literacy sessions were offered on campus, what time of day would you be most likely to attend? Please check all that apply.	2	Method of Education	Morning (9am-noon) (1) Afternoon (noon-5pm) (2) Evening (5pm-8pm) (3)
22 What is the maximum time you would want a typical financial literacy session to last?	2	Method of Education	30 minutes (1) 1 hour (2) 1.5 hours (3) 2+ hours (4)
23 What type of educational event/source are you most likely to attend/utilize? Please rank the following, with 1 being most likely to attend/utilize. (Drag to rank)	2	Method of Education	Workshops (1) Guest Speakers (2) Online content (self-taught) (3) One on one sessions (4) Large fairs (covers all aspects in one event) News (5) Newsletters (6) Other (7)
24 If you had to choose someone, who would be your ideal "coach" for one-on-one coaching sessions? Please rank the following, with 1 being most ideal	2	Method of Education	Peer (student) (1) Expert in the OSA&FL (2) Professional volunteer (3) Other: (4)
25 Which of the following would best incentive for you to attend? Please rank the following, with 1 being the best	2	Method of Education	Food (ex. pizza) (1) WPI apparel/items (2) Raffles for higher value prizes (ex. TV's) (3) Other: (4)
26 How important is it for WPI to be offering financial literacy sessions?	2	Method of Education	1-5 Leichardt
27 To which gender do you most identify with?	1, 2	Demographics	Male (1) Female (2) Other (3) Prefer not to say. (4)
28 What is your age?	1, 2	Demographics	18 or under (1) 19-24 (2) 25-35 (3) 36-45 (4) 46 or over (5) Prefer not to say. (6)
29 What is your major? Please include your major,	1, 2	Demographics	Tagged alphabetically

and any additional majors or minors.			
30 Which of the following best describes your racial or ethnic heritage?	1, 2	Demographics	White (1) Hispanic or Latino (2) Black or African American (3) Native American or American Indian (4) Asian/Pacific Islander (5) Other (6) Prefer not to say. (7)
31 Are you a domestic or international student?	1, 2	Demographics	Domestic (1) International (2) Prefer not to say. (3)

Alumni Data Table

Questions	Research Question	Topic Measured	Variable Coding
1 What best describes you?	1, 2	Demographics	Alumnus (1) Professional working in finance related field (2)
2 Have you ever taken a personal finance course in high school or college?	1, 2	Background	Yes (1) No (2) I don't remember. (3)
3 How long ago did you graduate?	1, 2	Background	Yes (1) No (2) I'm not sure. (3) Prefer not to say. (4)
4 Are you aware that the OSA&FL offers financial literacy sessions?	1, 2	Background	Yes (1) No (2)
4a How did you find out about the sessions? Please check all that apply.	1, 2	Background	Email (1) Screen advertisement (screens in the Campus Center, Rec Center, etc) (2) Newsletters/Flyers (3) Table-sitting information (tables in Campus Center) (4) Online advertisement (WPI websites/social media) (5) Other (6)

5 Have you attended a financial literacy session or other event offered by the OSA&FL?	1, 2	Background	Yes (1) No (2)
5a How many have you attended?	1, 2	Background	1-2 (1) 3-4 (2) 5+ (3)
5b What was the topic of the session(s)/event(s)? Please check all that apply.	1, 2	Background	Credit (1) Budgeting (2) Loans (3) Investing (4) Insurance (5) General finance after college (6) I don't remember (7)
5c Generally, how did you feel about the sessions?	1, 2	Background	1-7 Leichardt
5d Why have you not attended any sessions? Please check all that apply.	1, 2	Background	I was not aware of the sessions. (1) I feel that I do not require them. (2) The topics do not interest me. (3) I could not make it to any of them. (4) I always forget about them. (6) Other (5)
6 How would you personally rate your own financial literacy?	1	Knowledge	1-10 Leichardt
7 Savings accounts generally have _____ interest rates (than/to) checking accounts.	1	Knowledge	higher (1) lower (2) equal (3) I don't know. (4)
8 Your company offers a 401k match retirement plan. You invest \$2,000 into this plan. What is the added dollar amount that your company adds to it?	1	Knowledge	\$200 (1) \$1,000 (2) \$2,000 (3) I don't know. (4)
9 If your credit card is stolen and the thief runs up a total debt of \$1,000, but you notify the issuer of the card as soon as you discover that it is missing, what is the maximum amount that you can be forced to pay according to federal law?	1	Knowledge	Nothing (1) \$50 (2) \$1,000 (3) I don't know. (4)
10 Scott and Eric are young men. Each has a good credit history. They work at the same company and make approximately the same salary. Scott has borrowed \$6,000 to take a vacation to a foreign country. Eric has also borrowed	1	Knowledge	Eric, because the car is collateral for the loan. (1) Scott, because travelers are eligible for discounts. (2)

\$6,000 to buy a car. Who is likely to pay the lowest finance charge?			They will both pay the same amount because they have almost identical financial backgrounds. (3) I don't know. (4)
11 Why is it important to limit monthly spending to an amount less than one's take home pay?	1	Knowledge	In case there is a special shopping promotion. (1) Banks will lower your interest rate is less than 10% of your paycheck is deposited. (2) It is important to maintain a buffer of funds for emergency situations (medical, disaster, loss of job, etc). (3) I don't know. (4)
12 Rob and Mary are the same age. At age 25 Mary began saving \$2,000 a year while Rob saved nothing. At age 50, Rob realized he needed money for retirement and began to save \$4,000 a year, while Mary kept saving her \$2,000. Now they are both 75 years old. Assuming they both have the same interest rate, who has the most money in his or her retirement account?	1	Knowledge	They would each have the same amount because they put away exactly the same amount. (1) Rob, because he saved more each year. (2) Mary, because her money has grown for a longer time at compound interest. (3) I don't know. (4)
13 When you first begin repaying you federal student loan, you can change repayment plans at any time for free.	1	Knowledge	True (1) False (2) I don't know. (3)
14 What is the main difference between an unsubsidized loan and a subsidized loan?	1	Knowledge	Unsubsidized loans the student must pay the interest for all periods; subsidized loans the student does not have to pay interest until after a grace period. (1) Unsubsidized loans are paid for by the government; subsidized loans are paid for by private loan agencies. (2) Unsubsidized loans the student does not have to pay interest until after a grace period; subsidized loans the student must pay interest for all periods. (3) I don't know. (4)

15 Your take-home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay?	1	Knowledge	Federal income tax, property tax, and Medicare and social security contributions. (1) Federal income tax, Medicare, and social security contributions. (2) Federal income tax, sales tax, and social security contributions. (3) I don't know. (4)
16 If each of the following people have the same amount of take home pay, who needs the greatest amount of life insurance?	1	Knowledge	An elderly retired man, with a wife who is also retired. (1) A young single woman with two young children. (2) A young single woman without any children. (3) I don't know. (4)
17 What financial literacy topics matter most to you? Please rank the following, with 1 being the most important to you.	2	Method of Education	Debt management (1) Money Basics 101 (2) Developing a spending plan (3) Buying your first car (4) Building your savings (5) Student loan repayment options (6) Managing credit (7) Buying your first home (8) Investing basics (9) Other: (10)
18 Which financial literacy topics do you wish you understood better? Please rank the following, with 1 being the most important to you.	2	Method of Education	Debt management (1) Money Basics 101 (2) Developing a spending plan (3) Buying your first car (4) Building your savings (5) Student loan repayment options (6) Managing credit (7) Buying your first home (8) Investing basics (9) Other: (10)
19 Do you think financial literacy sessions in college would have been helpful?	2	Method of Education	Yes (1) No (2) I don't know. (3)

20 How important is it for WPI to be offering financial literacy sessions?	2	Method of Education	1-5 Leichardt
21 To which gender do you most identify with?	1, 2	Demographics	Male (1) Female (2) Other (3) Prefer not to say. (4)
22 What is your age?	1, 2	Demographics	18 or under (1) 19-24 (2) 25-35 (3) 36-45 (4) 46 or over (5) Prefer not to say. (6)
23 What is your major? Please include your major, and any additional majors or minors.	1, 2	Demographics	Tagged alphabetically.
24 Which of the following best describes your racial or ethnic heritage?	1, 2	Demographics	White (1) Hispanic or Latino (2) Black or African American (3) Native American or American Indian (4) Asian/Pacific Islander (5) Other (6) Prefer not to say. (7)
25 Are you a domestic or international student?	1, 2	Demographics	Domestic (1) International (2) Prefer not to say. (3)